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From the Editor's Desk

Alvin Bryant has a long history with growing and hybridising orchids over many decades. He founded Bryant's Orchids at Kurnell, NSW. In the late 1970s he was one of the first people to seriously import improved cultivars of Venus Fly Traps into Australia. But he is far better known for his extensive work in breeding showbench style and cupflower hybrid Cymbidiums in a range of new and exciting colours. Alvin also experimented extensively with various potting mixes and fertiliser formulas. Many of these results and discussions appear in numerous historical back issues of the *AOR*, for which Alvin has always been a strong supporter. His son Greg continues the work his father started with Cymbidiums. Alvin now lives in a climate too warm to successfully bloom these Cymbidiums regularly and has now turned his hand to *Cattleya* hybridising. In this issue, Alvin discusses the criteria he is looking for in floriferous Cattleyas and the parent plants he considers the cornerstones to this style of breeding.

Brian Dear and Yin Chan attempt to answer a common question asked by orchid growers, being "What is the optimum pH that orchids prefer?" in their article "Changing the pH and supplying calcium and magnesium to Orchids". A lot of research and practical & personal experience has gone into this paper.

Eric and Dorothy Collins from Coffs Harbour, NSW discuss their cultural methods for growing "Softcane" Dendrobiums – the real Dendrobiums! They have had success after much trial and error over many decades growing these orchids. Don't be afraid to experiment is one of the main messages here. In this article there are many wonderful practical tips and hints to growing and blooming these showy and colourful orchids to perfection. I have supplemented this paper with many new Australian-bred "Softcane" *Dendrobium* hybrids and cultivars, many that have not been seen before and were only recently registered in 2016.

Jay Pfahl from Florida USA is the curator and owner of arguably the largest orchid species photographic site on the Internet: The Internet Orchid Species Photo Encyclopedia (www.orchidspecies.com). As of October 2016, it has exceeded 21,000 identified and photographed orchid species (in over 850 genera) with many examples photographed in the wild. A huge number of orchid photographers and enthusiasts worldwide have supported this site since its inception. In this issue Jay discusses his six favourite orchid species, with his sentimental reasons for each selection.

We again have a significant coverage of new Australian native terrestrial orchids, with a number of new species described in this issue by David Jones, and in collaboration with Garry Brockman. Peter Branwhite reports the pollination of one of the native bearded orchids, whilst Alan Stephenson discusses the endangered Buttercup Donkey Orchid - *Diuris aequalis*.

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David Banks
Australian Orchid Review
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Cover Shot

Dendrobium
Hills District Gold
'David's Gold'

This floriferous newly registered hybrid is a cross between *D.* Golden Blossom and *D.* Maude Tyler. Its golden flowers can produce 3-5 blooms per inflorescence along the length of the pseudobulb.

Plant & photo: David Banks

Cattleya Potential

Text and photos by Alvin Bryant

Arguably, the world's most beautiful flower is under marketed yet it need not be.

Cattleyas are admired for their great beauty but they have limitations for mass sales such as size, delicacy, cost and more. No doubt many have thought about how to increase their market potential but there seemed no viable pathway. This development should help change that perception.

Cattleyas will benefit if more hybridisers consider the plant and not just the flower.

In 1989, 38km north of Brisbane Queensland some igloos were built and used to grow *Phalaenopsis*, Dendrobiums and Cattleyas. Gradually, over the seasons, it was felt the exotically beautiful Cattleyas needed greater variety and the way to do it was by drawing on the diversity of the bifoliates. However, most of the highly developed Cattleyas are tetraploids. Hybridisers using trial and error methods before chromosome counting was well understood had brought this about. This then became a problem as most of the bifoliate Cattleyas appeared to be diploids. (To digress, in 1952 *Sander's List of Orchid Hybrids* was lamenting the loss of fertility in the hybrids. However, about this time Mrs Menninger a scientist of Greenoaks Orchids, published an article pointing out that the loss of fertility was the result of chance tetraploids appearing and because of their superior qualities they were being used as parents. When crossed with diploids the progeny were usually sterile.).

By 1997 a substantial collection of plants existed. The temptation was too great so 100 crosses per year were made for the next three years. Of all the bifoliates only two reputed tetraploids (4n) were acquired namely, *Cattleya loddigesii* 'Streeter's Choice' and *Cattleya* Chocolate Drop 'Garcia' 4n (a mericlone mutation of the well known cultivar 'Kodama'). Two others were of special interest being *Cattleya* Kew and *Cattleya* Caudebec 'Spots' as they had their flowers along the inflorescence so they were crossed with the two known tetraploids.

Chance can play a determining role in life and in this case a stunning break came when in 1998 a visit to Aranbeem Orchids gave positive direction. On sale was a block of *Cattleya* Caudebec in flower and among them were several which observably had made the jump to tetraploid status. The sighting of the suspect tetraploid Caudebecs with their superior substance suggested commercial feasibility and the flowers along the stem suggested a hybridising programme to develop this *Cymbidium*-style property. Needless to say some of these were purchased. Two were used immediately and good numbers were grown of the suspect tetraploid crosses. They were the hybrids Gerard Nappert (*loddigesii* 'Streeter's Choice' x Chocolate Drop 'Garcia') 4n, Streets Ahead (*loddigesii* 'Streeter's Choice' x Caudebec) using several different *C.* Caudebec parents (all 4n suspects) and the Deception Drops (Chocolate Drop 'Garcia' x Caudebec 4n). The *Cattleya* Caudebec purchased first in 1997 also bred as a tetraploid.

This development plan was the same as for the highly successful tetraploid development of Cymbidiums. Where a pool of genetic material carrying all the desired genetic material was put together to enable the complex task of making generations of crosses to steadily filter out unwanted properties. The aim was to obtain commercially viable plants to provide a colour range for each month with productivity and vigour at the top of the list.

The bonus for this development was the availability of the finest Cattleyas. All that was needed for the programme to succeed was just one tetraploid *Cattleya* with a suitable raceme of flowers. That *Cattleya* existed. In fact more than one existed as there were a number of suitable Caudebecs and other crosses still being checked out. The length of the raceme from first flower to the pseudobulb (known as the peduncle) was also capable of correction.

The crosses started flowering in 2003 but by this time I was overseas. The results satisfied me that a successful outcome could be achieved. This type of development was so obvious that I formed the opinion that there would be others well in front of me so it languished. When I returned and realised there was no indication that such a development had occurred, the decision was made to go ahead.

The descriptions below link to photographs showing some of the plants which have either been gained from first generation crosses or acquired. The crosses are (1) those which increase the pool of genetic material and (2) those which have one or both parents incorporating the *Cymbidium*-type raceme.

Flowering time for bifoliates can be nearly all the year but those shown are all from January to late May. Flowering time can be controlled by day length according to my reading. If I was to give this development a name it would be "*Cattleya* Raceme Development'.

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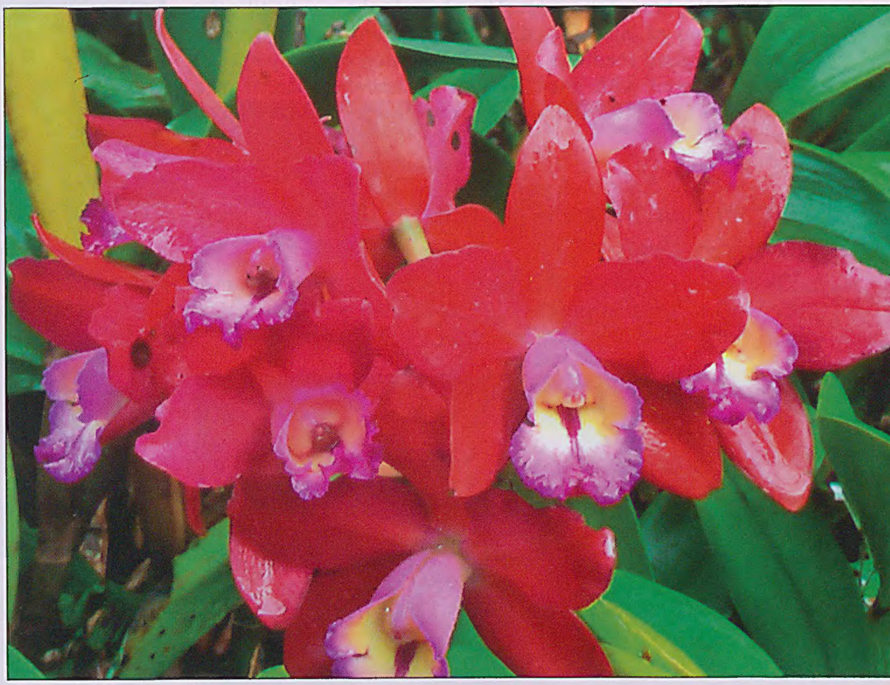
Some of the parent plants and flowered seedlings.

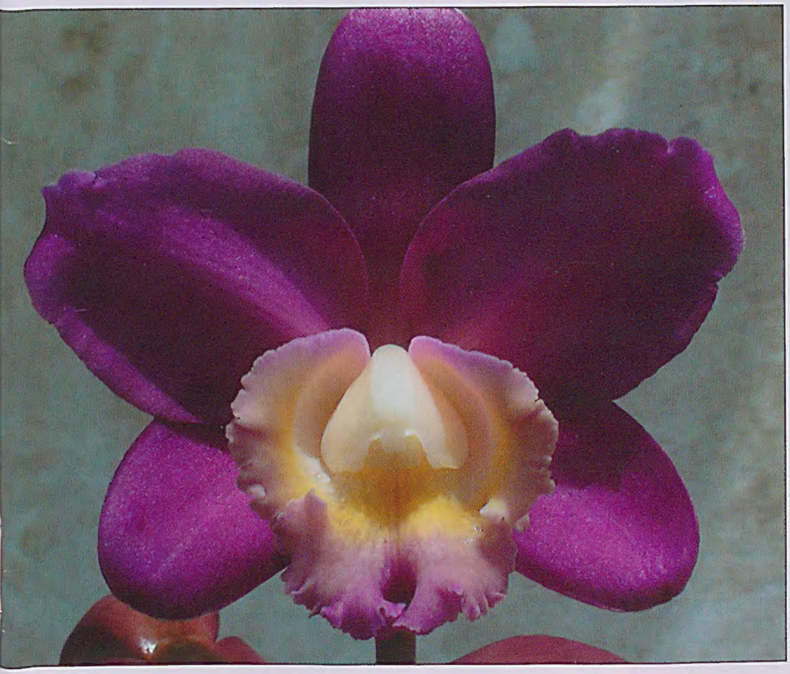
▶ *Cattleya* Gerard Nappert

This cross offered flowering time from January, good flower count, and solid vivid colour to start off the gene pool. Evidence suggests that further development of this cross was started but never carried through. Possibly the lack of knowledge about chromosome numbers at that time may have caused failure with inability to hold pods. The cross is worthwhile in its own right with magnificent show winning rich colour cluster type displays. The cultivar 'Carmine Candy' is shown here.



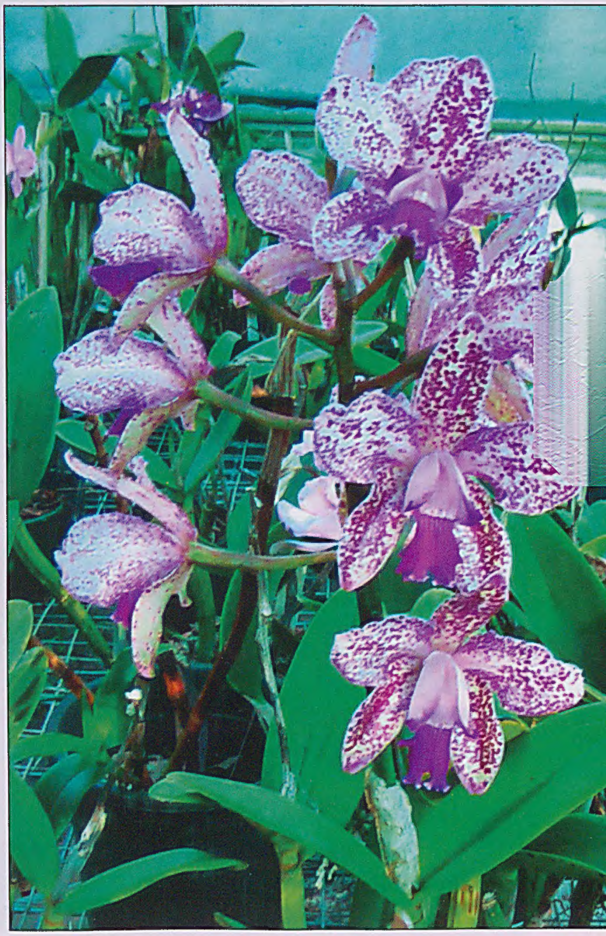
▼ *Cattleya loddigesii* 'Streeter's Choice' is a tetraploid species.

It can carry 16 flowers. The cluster looks like the Flame on the Olympic torch. They have leathery substance intense colour, good shape and longevity. Some of its seedlings start flowering in January. It is one of the key parents in the gene pool.



▶ *Cattleya* Caudebec 4N

There are a number of Caudebec's in circulation. The spots are usually recessive in the progeny where the other parent does not have a spotted background. There are other suitable parents but in my search they were the best to use at that time. They are the key to the development programme. The parents of Caudebec are (Sophia Martin x Penny Kuroda). Penny Kuroda breeds as a tetraploid so if a Caudebec breeds it could be a tetraploid. Results so far support this but it may not always be the case. The cultivar 'Tall One' is shown here.

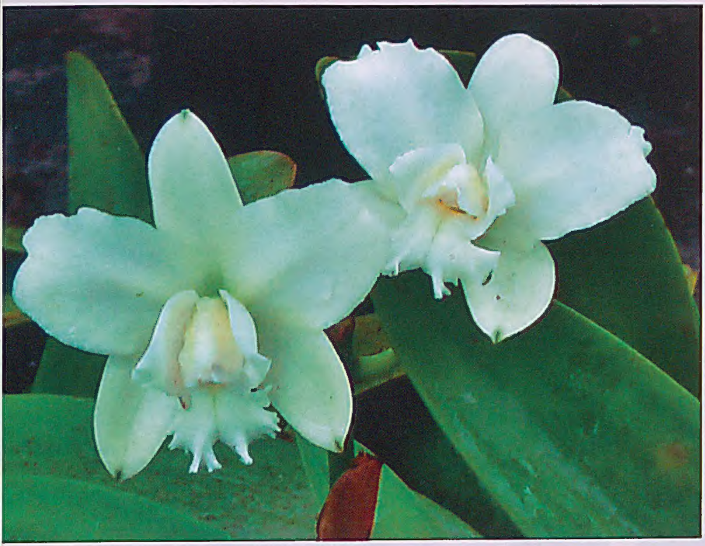


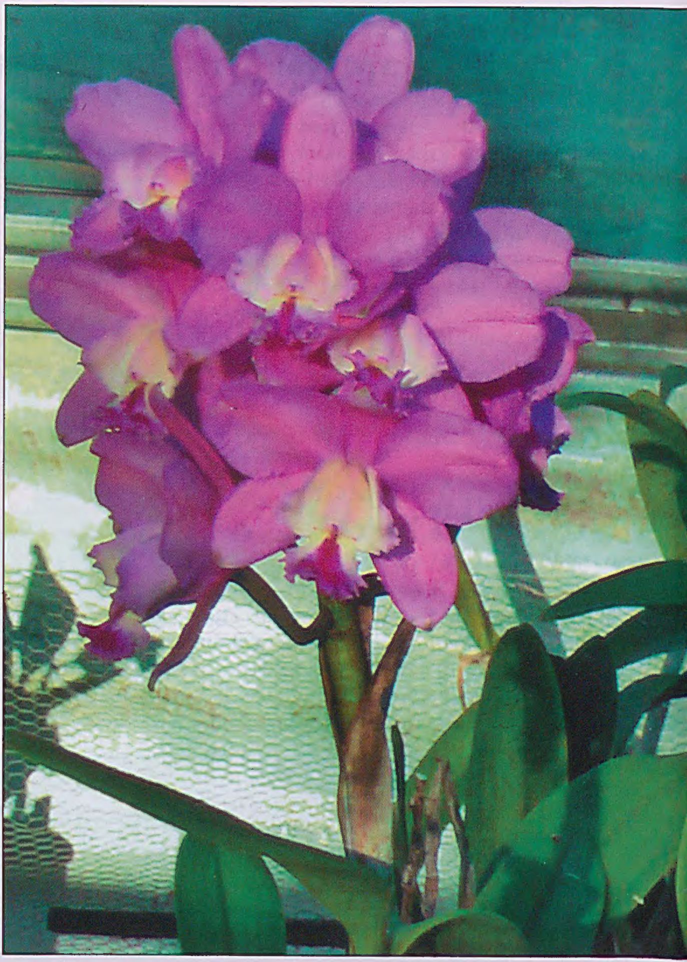
▶ *Cattleya* Streets Ahead 'Harcaud'

One of the best of the cross. The photo looks exactly like the award photo of 'Streeter's Choice' only pink. There were a number of good seedlings. Some interesting ones are shown here. If crossed with another with a Caudebec parent or a sibling some with *Cymbidium*-style racemes should result.

▼ *Cattleya* Streets Ahead (albino type)

There are several nice alba (albino) forms. This is good news as it means the alba property exists in both parents. Also it confirms white is in the colour range.





▶ *Cattleya* Streets Ahead 'Spatter'

The flower is massive and shows it. Although these seedlings are years old they were not grown to flowering size for many years. It will be interesting to see how this matures.

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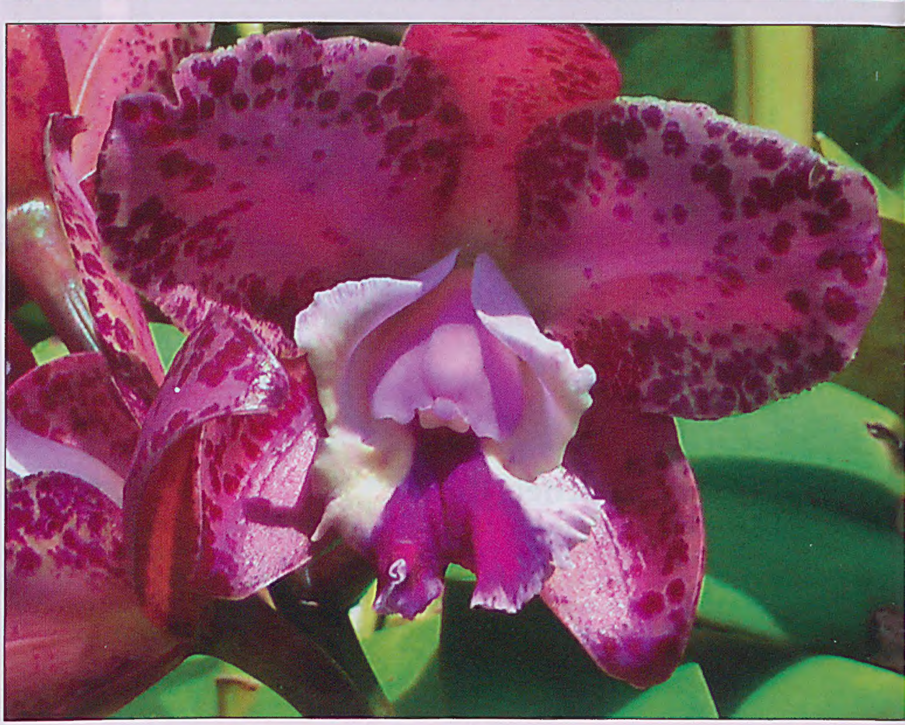
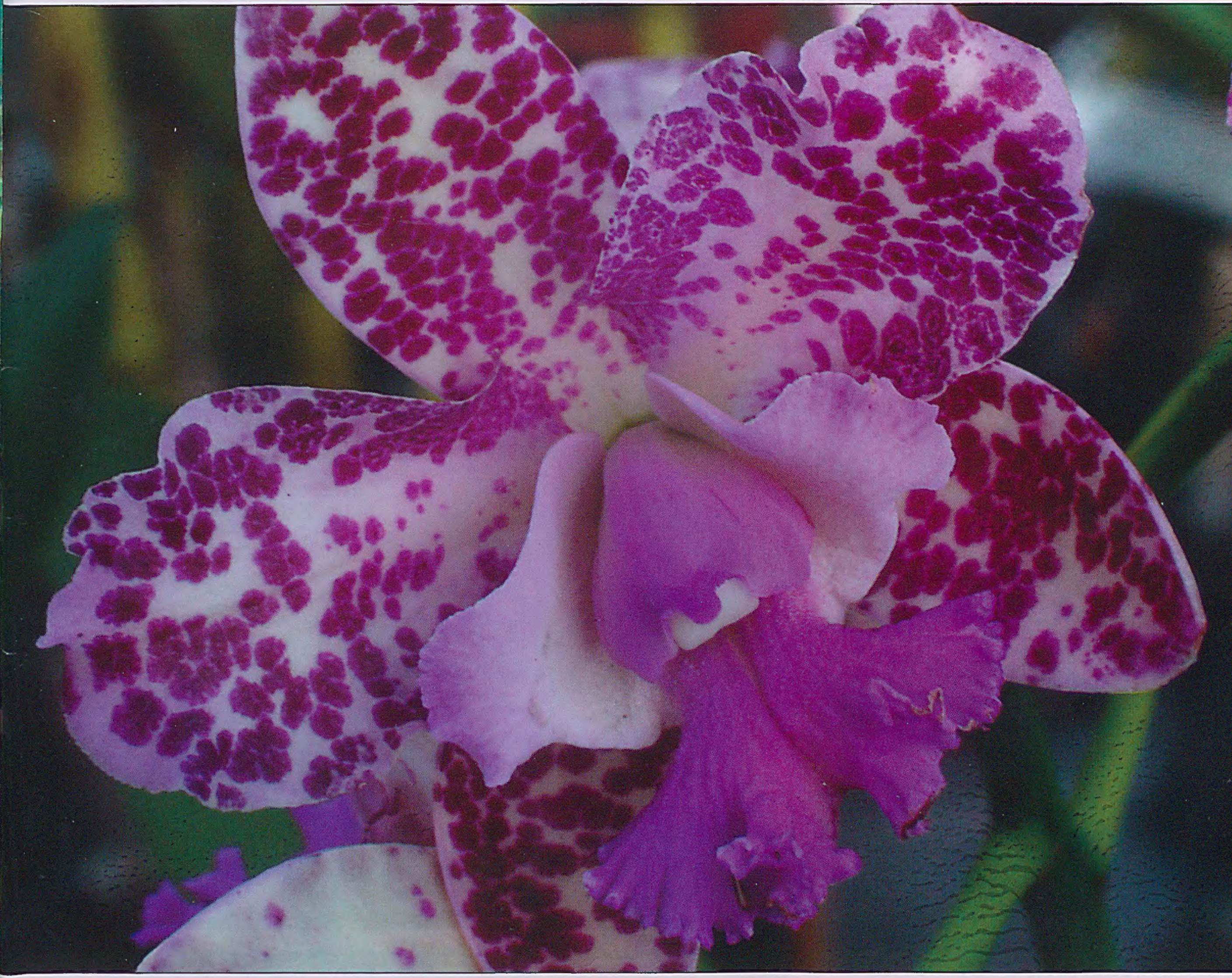


▼*Cattleya* Caudabec Candy 'Doug'

Note the spelling if you look up parentage. This first flowering seedling is most striking. It is just one of a number of outstanding siblings with Caudebec 'Southern Cross' (Aranbeem Orchids) as one parent. Ross Maidment is well aware of this development and is an excellent source of the latest crosses.



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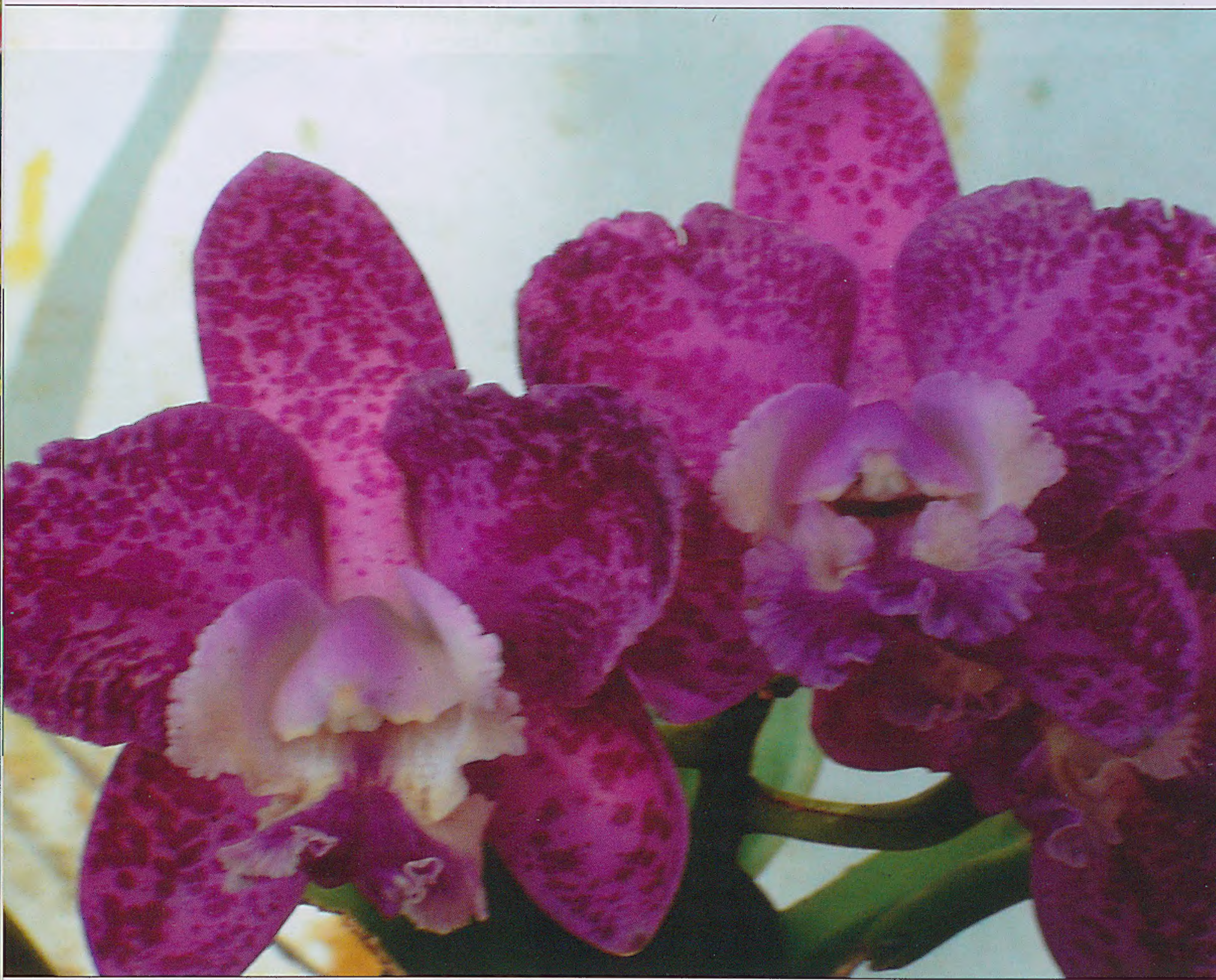
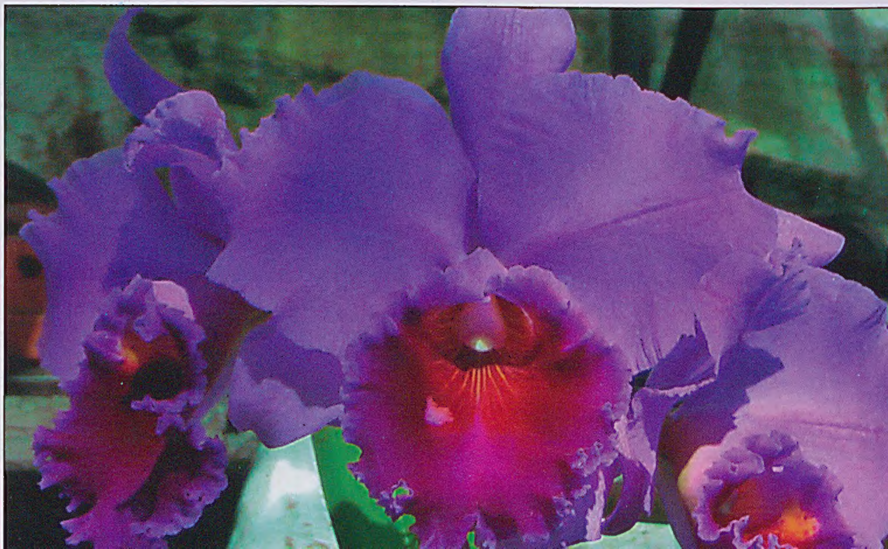
▼*Cattleya* Streets Ahead 'Hey'

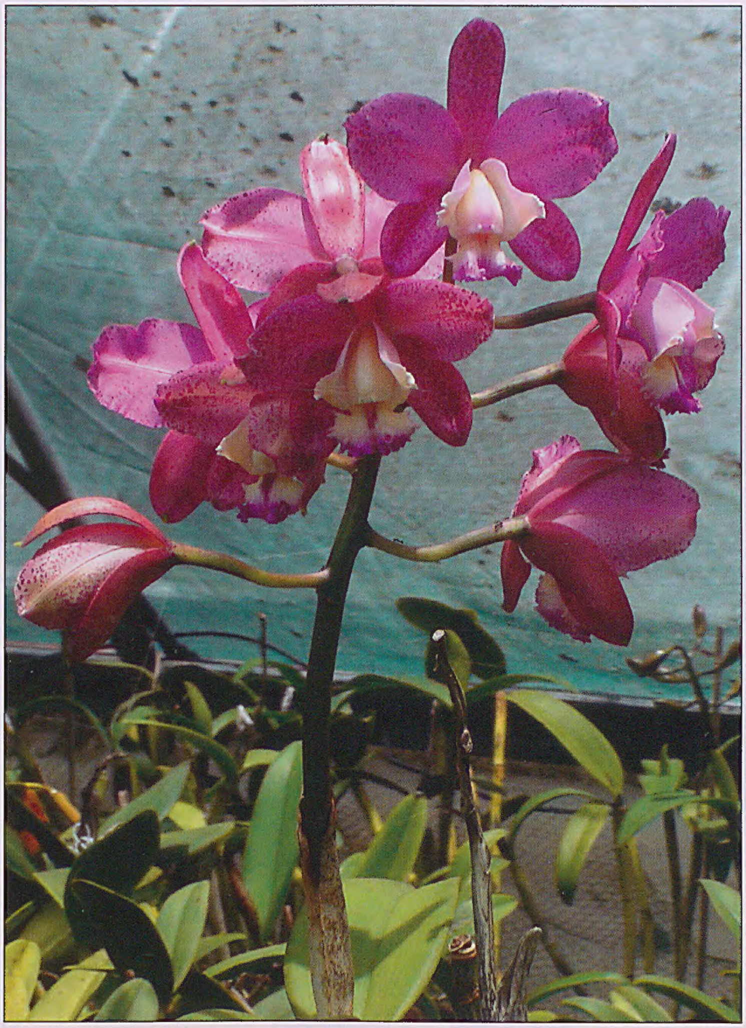
This is another example of the many 'hunky' results. They still have to grow to maturity to be properly assessed.



▶*Rlc.* Burdekin Trader 'Snaz'

Note the natural position of the flowers. Avoid anything which has to be 'fiddled' to get the flowers to sit right. This is an example of the readily available standard Cattleyas to add desirable characteristics.



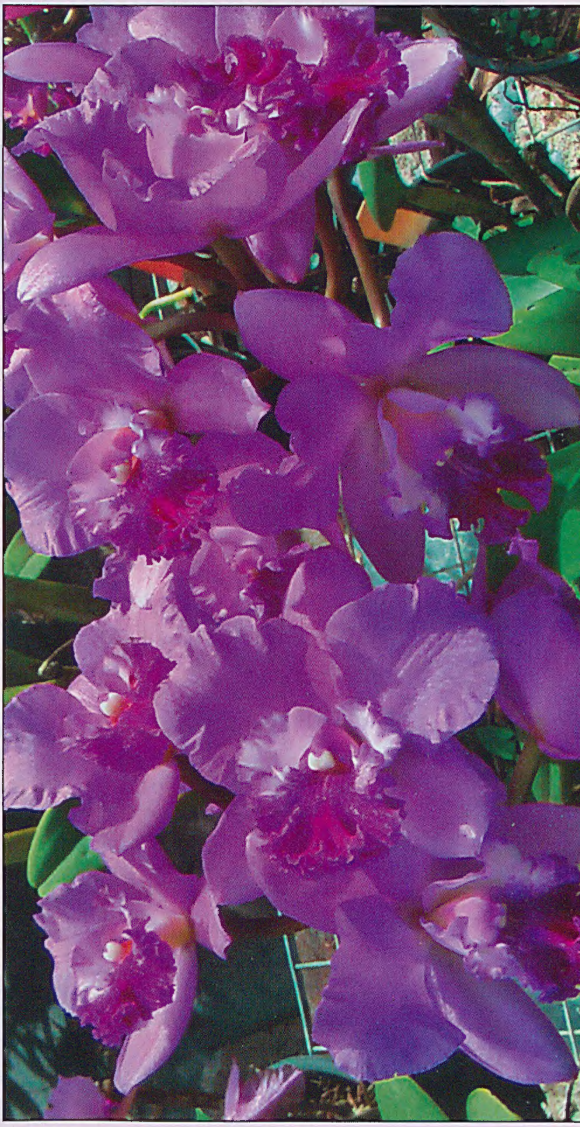


◀ *Cattleya* Streets Ahead 'Hi Street'

It is vital that the raceme should have enough stem length from plant to bottom flower. This shows the property is available.

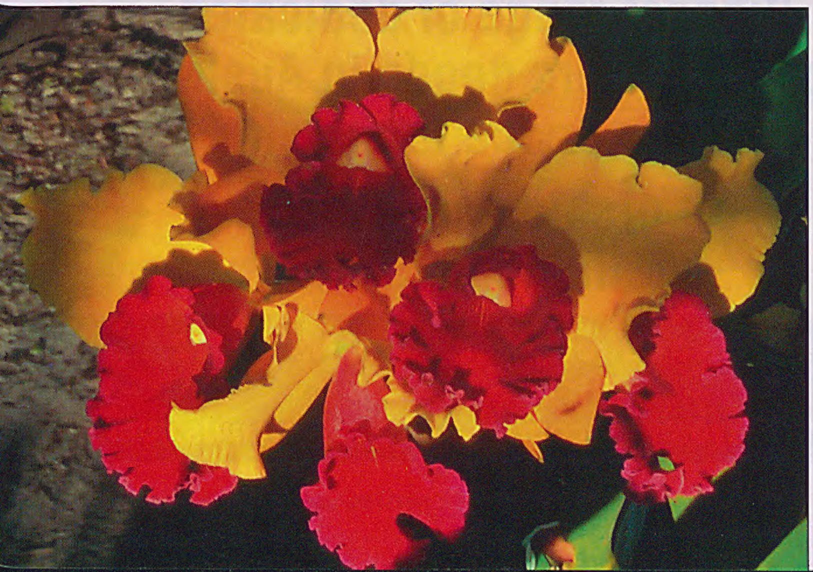
▼ (*Rc.* Dal's Reward x *C.* Caudebec) 'Darling'

This is a most significant cross. It was one of the first to flower and exemplified the development. The raceme had over ten heavy substance appropriate size *Cattleya* flowers along the stem. The pathway to mass producing *Cattleya* blooms for market now existed.



▼ *Rlc.* Tyger River 'Sal'

This shows one of a number of vivid yellows in the gene pool. Some are already first generation crosses to intensify the colour. This cross was aimed at getting Christmas yellows as one blooms just before the end of December and the other in February. It succeeded but the flowers were scattered and not in block form.



Cattleya Deception Drop

This hybrid shows the throwback to the species *Cattleya tigrina* (syn. *Cattleya guttata*). Sibling crosses of the Deception Drops should yield some spectacular results. The shape in the Gerard Nappert's and the Deception Drops will be improved in percentage in the seedlings as one parent in each case had good shape. The cultivars 'Globe' (left) and 'Sphere' (right) are shown here.

I decided to come out of retirement and detail progress to date so others can take over and have the thrill of being in a race. ■

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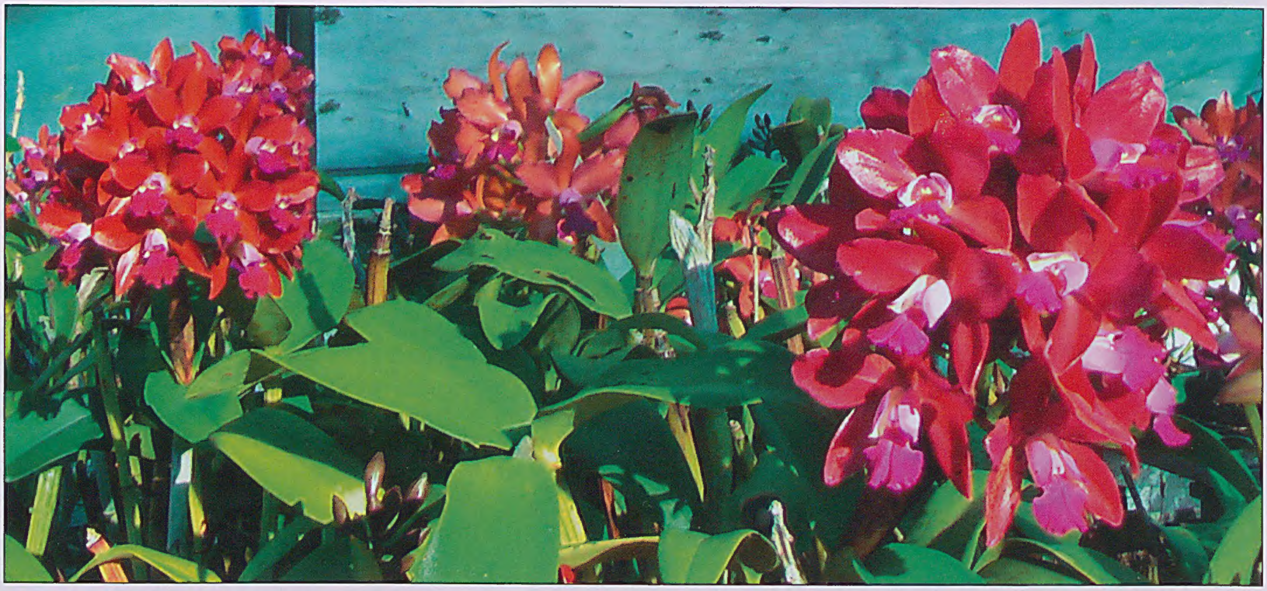

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AOR 009

Changing the pH and supplying calcium and magnesium to Orchids

by Brian Dear and Yin Chan

A common question asked by orchid growers is "What is the optimum pH that orchids prefer?" If it is subsequently decided the growing medium is too acid, the next question that follows is "Which product should be used to raise the pH?" There are a number of liming products to choose from and many of these also supply calcium and magnesium, but if you don't need to change the pH, other products are available that will supply these essential nutrients without altering the pH. The following paper discusses the various liming products and their suitability for application to orchids. It also describes products available for supplying additional calcium and magnesium that do not affect the pH of the growing medium.

Optimum pH for orchids

Firstly it is important to define pH and why it is important. The pH is a measure of the acidity of the aqueous solution and is expressed in a scale of 1-14 (Figure 1).

At pH7, the solution is said to be neutral. In orchid culture, the pH of the growing mix solution is important as it can directly affect the orchid root growth and influences the availability of essential nutrients to the plant. Some elements such as phosphorus and boron become less available as the pH increases (more alkaline). Conversely if the pH becomes too acid, elements such as calcium and magnesium become less available (see Figure 2).

The pH also affects the growth of bacteria and fungi that are important for the growth of the orchid. Microorganisms for example are important for breaking down organic material and making its constituents available to the plant roots.

Typically the optimum pH for most plants is between 5.4 and 6.4 as this is where the majority of plant nutrients are most soluble, however plants do vary in their preferred pH. The optimum pH and lime requirements of orchids is subject to much debate but varies with the species and is influenced by the environment in which the species evolved. Orchids, and particularly the epiphytic species, often grow in heavily leached decomposing organic matter which is a slightly acidic medium. Most high rainfall leaching environments where orchids grow naturally could also be expected to be more acidic. In contrast orchids found growing on limestone rocks might be expected to prefer a more neutral pH.

However Dr George Tsambourakis pointed out that even orchids found growing on limestone rocks in mountainous regions of South-east Asia, that suggests an alkaline or neutral pH environment, may grow in a crevice filled with organic matter that may be slightly acid. Particularly as there are frequent falls of rain in these areas where the pH of the rainwater is usually slightly acid at about 5.7-6.8. Rainwater is acid because it dissolves CO_2 in the air to form carbonic acid.

The optimum pH for an orchid species as recommended by different growers may vary depending on the components of the potting mixes they use, the fertilisers they apply their water quality and watering frequency. So expect to see a range of optimum pH values quoted for a particular orchid species by different growers.

With a few exceptions, the optimum pH for most orchids is considered to be around 6.5 which is similar to the pH of rainwater. A pH between 5.4 and 6.5 should be adequate for most orchids as this is the pH range where essential nutrients are freely available without being either toxic or deficient. There are exceptions, however, with some orchids said to grow better where the pH is lower around pH 4 to 5. These are discussed in more detail below.

Orchid mixes that utilise pine bark will tend to be slightly acidic and most mixes will become more acid with time as they decompose and are leached. This may not be a problem if plants are repotted every year or so and fresh potting mix is used. Where plants are not repotted frequently, adjustment of the growing medium pH with lime or dolomite may be necessary.

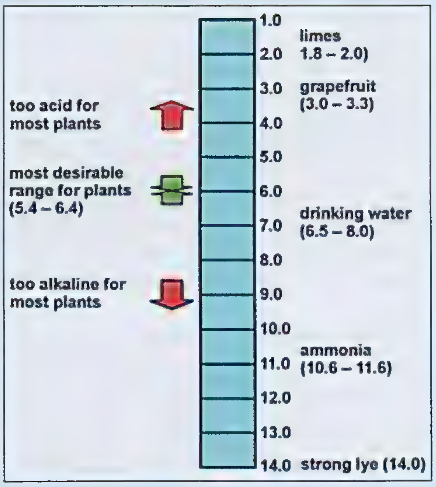

Figure 1. The pH scale.
From: Essential pH management in greenhouse crops by B. Pennisi and P. Thomas.

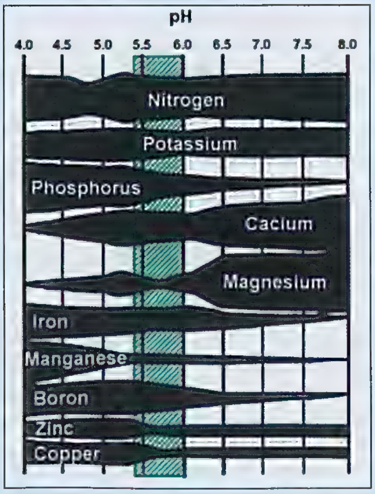

Figure 2. The change in availability of essential nutrients with pH.
From: Essential pH management in greenhouse crops by B. Pennisi and P. Thomas.

Very little information is available in the literature on the optimal pH for different orchid species. Furthermore, very often the methods used in pH measurements were not reported. As the pH values obtained by different measurement methods can vary by up to 1 pH unit, it can make comparisons between different reports meaningless.

Based on the experience of successful orchid growers its possible to produce some optimum pH values for a number of orchid genera and species. The Cymbidium Orchid Society of Victoria suggests that *Cymbidium* orchids have an optimum pH around 5.5. The optimum pH is thought to be even lower for Australian native cymbidiums. Harry McElroy states that the Australian native *Cymbidium suave* grows in tree stumps where the pH is relatively acid between pH 4 and 5. Application of liming products to this species is therefore not recommended, but instead adding acidifying agents such as pineapple juice (25ml-50ml per litre water) or coffee grounds which has pH around 4.5 may be beneficial.

Many slipper orchids, (*Paphiopedilum*), are found growing on limestone mountains which suggest they might require a high calcium and a more neutral pH growing medium from 6.5 to 7. An understanding of the origin of the species is therefore important. Orchiata™, who supply potting mix for *Paphiopedilum*, suggest *Paphiopedilum* belonging to the subgenus *Brachypetalum* and some members of the subgenus *Parvisepalum*, need additional dolomite lime. In contrast, they suggest *Paphiopedilum anitum*, *Paphiopedilum ciliolare* (from the Philippines), *Paphiopedilum sangii* (from Indonesia) and *Paphiopedilum papuanum* (from Papua New Guinea) prefer a lower more acid pH and are less likely to need lime or dolomite.

Orchid growing mix from Orchiata has dolomite added during production. Therefore species requiring a neutral pH should not need additional lime or dolomite added. However for those species preferring a more acid mix, such as those listed above, Orchiata recommend washing Orchiata potting mix before use to remove the added dolomite.

Les Nesbitt uses a more acid growing medium of pH 5.5 for Australian native terrestrial orchids. Most eastern Australian soils where terrestrials grow naturally are moderately acid which is consistent with this recommendation.

Yamamoto Orchids in Hawaii suggest *Dendrobium nobile* prefers a slightly acidic mix with a pH around 5.0. Cedarvale Orchids in Queensland have found Australian native dendrobiums, including *Dendrobium bigibbum* (Cooktown orchid) do well with a more neutral pH of 6.5 to 7.0 and spray their plants with a lime-water solution in early autumn and early spring. Down Under Native Orchids also recommend the application of lime-water in spring and autumn for their Tropicool™ native dendrobium orchids (see below for details on Lime-water). Similarly Gerry Walsh (The Rock Lily Man) also annually applies lime to *Dendrobium speciosum* to counteract acidification of the potting medium.

Phalaenopsis (moth orchids) are frequently grown in sphagnum moss which can become moderately acid after several months. Most growers recommend replacing sphagnum moss with fresh moss regularly as it degrades quickly.

In summary, orchids will vary in their optimum pH depending on the orchid species and the environment where they originated. The pH of the growing medium will vary depending on its constituents, its age, the fertiliser regime, the watering frequency and the quality of the water. For this reason there is likely to be some variation in the reported optimum pH values for a particular species by different growers. Most orchid mixes will become more acid over time and is one of the reasons to regularly repot your orchids into fresh potting mix.

Testing the pH of the water leachate out of the bottom of the pot with pH test strips will give an indication of the pH of the growing medium, so start by testing the leachate. The product you choose to apply will depend on whether you are trying to supply Ca, Mg, adjusting the pH or a combination of these.

Liming products

Agricultural lime

Agricultural lime is crushed limestone $CaCO_3$. It contains about 37-40% Ca and supplies calcium for plant growth and decreases soil acidity, i.e. raises the pH. It can be crushed to different fineness or particle size. The finer the grind, the quicker it will change the pH. Super fine agricultural lime or Aglime reacts reasonably quickly, typically over several weeks to a month if the potting mix is moist. If it's less finely ground it is slower to react and dissolves more slowly. Aglime is typically used in the garden to raise the pH and add calcium.

If larger limestone chips are used in the orchid growing mix they will dissolve **very slowly** and only supply a very small amount of Ca and have a minimal effect on pH. The pH of the water applied will affect the rate Ca is released. Relatively acid water is required to dissolve the limestone chips. This also applies to crushed shell grit.

Down Under Native Orchids recommend the application of lime-water (F70 Superfine Aglime lime dissolved in water at 1g per litre) in early autumn and early spring. They suggest this is beneficial when growing plants in pine bark which is an acidifying material.

Dolomite

Dolomite is natural occurring rock containing calcium magnesium carbonate. Dolomite is $CaMg(CO_3)_2$ and supplies both calcium and magnesium. It typically contains 22% calcium and 12% magnesium. Dolomite will also cause a soil to become less acid i.e. raise the pH. It is slowly reactive and will change the pH over weeks or months. Dolomite is often blended with additional lime to produce dolomite lime which has a 5:1 ratio of lime and dolomite. This ratio better matches the plant requirements of calcium and magnesium.

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Burnt lime or Quick lime

Burnt lime is calcium oxide (CaO). It results from heating limestone to drive off carbon dioxide. It is more concentrated than agricultural lime, is caustic and difficult to handle. It is rarely used in horticulture.

Hydrated lime, Brickies lime or Slaked lime

This is calcium hydroxide ($Ca(OH)_2$). Often referred to as brickies lime. It is highly reactive and can burn plants. It is not used on gardens. It has a much stronger neutralising affect than Aglime and can cause soils to become too alkaline. It is used in concrete and mortar.

Crushed shells

Mainly composed of calcium carbonate ($CaCO_3$). It is usually too coarse to be effective in the soil as source of calcium or influence the pH. Any effects on calcium supply will be very slow to negligible.

Other sources of calcium and magnesium

Gypsum

Gypsum is calcium sulphate ($CaSO_4$). It supplies both calcium and sulphur. Gypsum is fairly soluble and has a minimal to no effect on soil pH but is a good source of calcium and sulphur. It is used on some types of clay soils (sodic clay soils) to improve soil structure and cause them to be more friable rather than setting hard.

Cattleyas and to a lesser extent Paphiopedilums are said to be prone to calcium deficiency which appears as black rot on leaf tips during rapid growth in the warmer growing season in newer leaves. The first sign of calcium deficiency in cattleyas is a watery lesion that turns black. Application of calcium in the form of gypsum or dolomite either sprinkled on the surface or dissolved in water in late winter or early summer before active growth commences is suggested to control this deficiency. Cymbidiums also have high Ca requirement that can be as much as twice that of Cattleyas according to Harry McElroy of the St. Augustine Orchid Society.

Epsom's salts

Epsom salt is magnesium sulphate ($MgSO_4$). This product supplies both magnesium and sulphur but has a minimal effect on soil pH. Magnesium is important for flower production and is said to be beneficial for *Phalaenopsis* and Cymbidiums. Magnesium deficiency occurs in older leaves and appears as a mottling of the leaf cupped leaves and yellowing between the leaf veins (chlorosis). Magnesium deficiency frequently occurs with the onset of cold weather.

Therefore, the above offer a range of choices, depending on the actual problems to be addressed. For addressing acidity problems, fine agricultural lime or dolomite lime is the best choice. If it is to address Ca and/or Mg deficiencies, then gypsum or Epsom's salt is the preferred choice. However most orchid fertilisers will contain sufficient Ca, Mg and S and application of either gypsum or Epsom salts should not be required as a nutrient source.

(It should be emphasised that care needs to be taken when adding liming products and only apply it to some test plants to begin with unless you have previous experience with its safe use. Strongly neutralising products such as burnt lime and hydrated lime or brickies lime should not be used. The information in this article is a guide only. Seek advice from local orchid growers on their experience with applying products that may change the pH and proceed slowly.)

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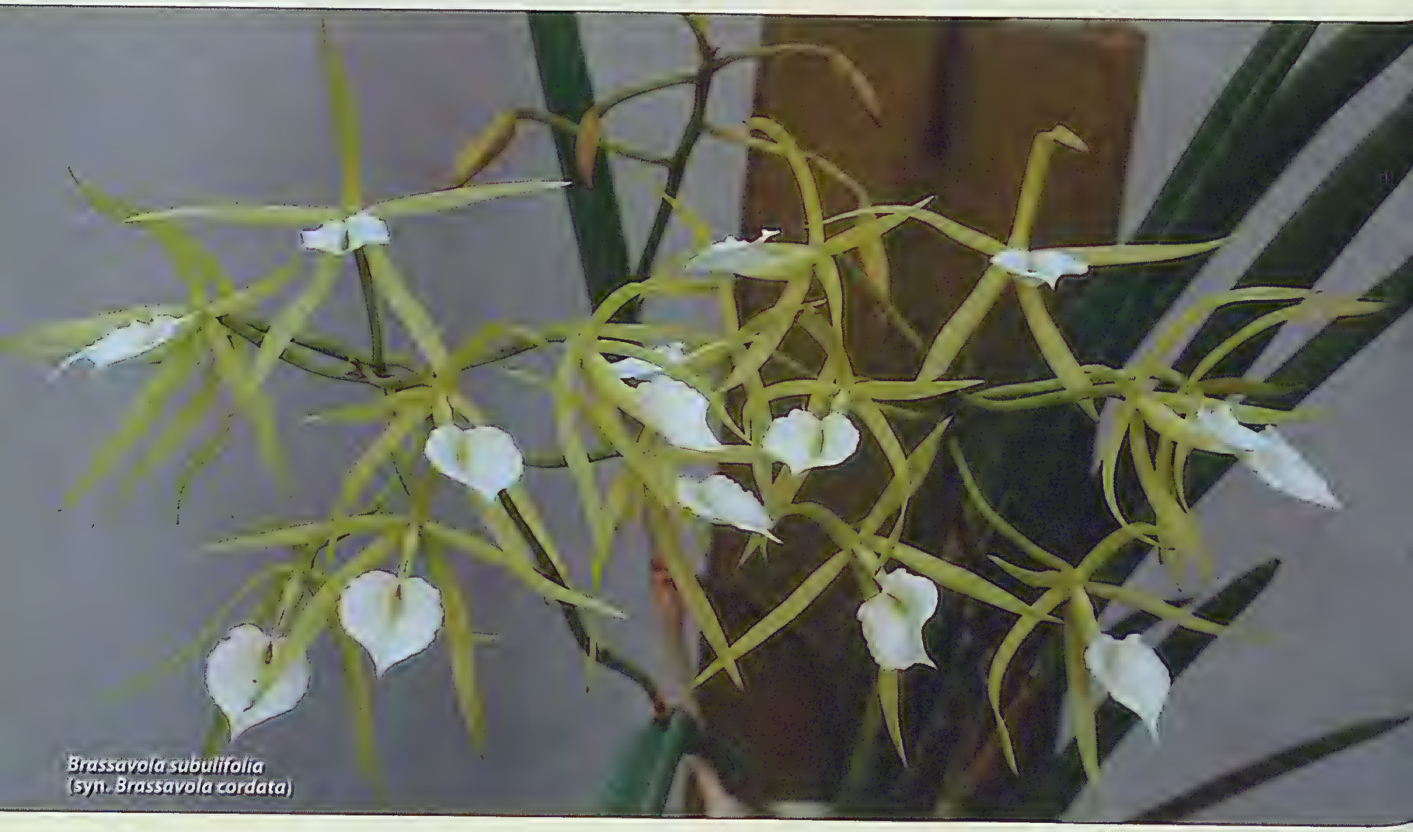
Six of my Favourite Orchid Species

by Jay Pfahl (Internet Orchid Species Photo Encyclopedia)

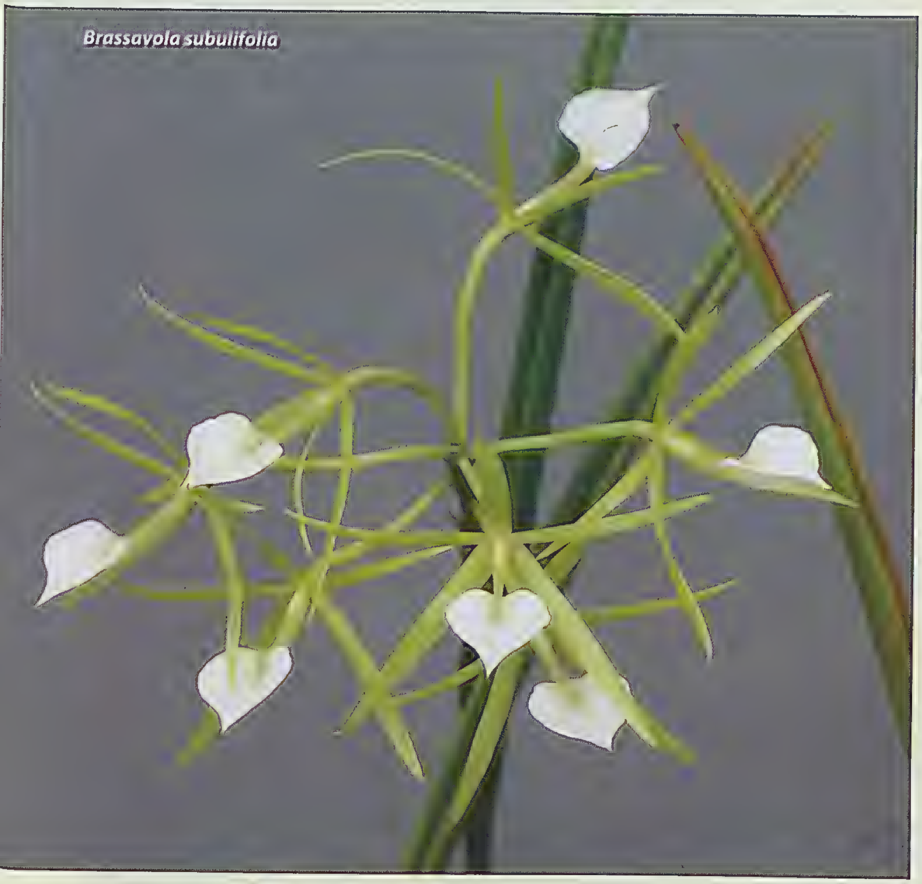
It was the mid 1980s, a time when I was young, married and had no kids. We had opened a jewellery business in Key West, Florida and were living the laid-back lifestyle of the Florida Keys. Income was good, the business was taking off and we had bought a nice house to live in. Things were going quite well and I was lulled into a sense of perfectness... Then it happened, I bought a *Phalaenopsis* hybrid and the curse began!

Some 25 or so years later and I now have various hundreds of orchids (even though more than half sadly died after the tidal surge of Hurricane Wilma in 2005). Then I embarked upon an impossible or maybe improbable task of compiling a photo library of the Orchidaceae. The Internet Orchid Species Photo Encyclopedia (**www.orchidspecies.com**) consumes me. My wife couldn't be more jealous of a 25 year old beauty than she is with the time allotted to enlarging my website. I try to tell her that I could be in a bar watching sports with my buddies and drinking heavily but that does not assuage her. I try to spend 3 to 6 hours per day on the site and for that reason (as of October 2016) it has now exceeded 21,000 identified and photographed orchid species (in over 850 genera) with many of them in their actual environments.

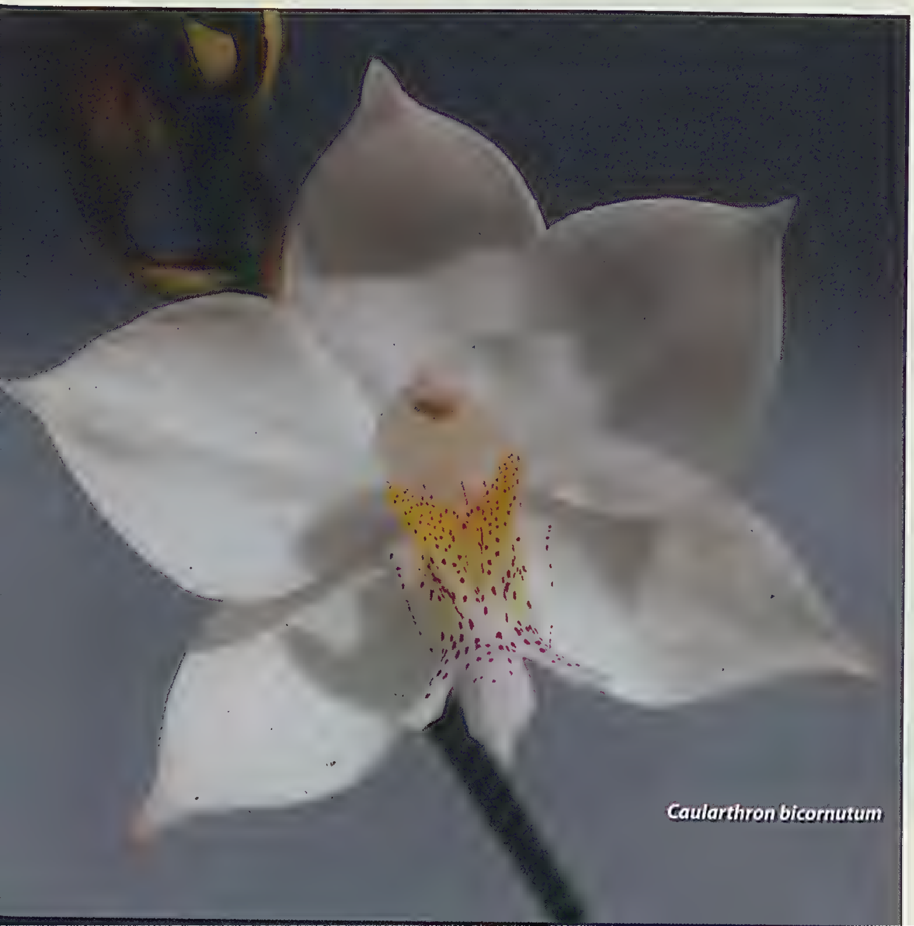
After the purchase of that fateful *Phalaenopsis* I went with my wife to Jamaica. We were travelling along the north coast road from Montego Bay to Negrill in the west, when driving along I spied four or so 10cm long green fingers arising from the top of a fence post. I jammed on the brakes and pulled over, got out and saw this plant (at the time I had no idea of what it could be as it was a seedling and I was new to the game) so it ended up in my luggage and went home with me. Four years later it bloomed and low and behold I had a specimen of ***Brassavola subulifolia***. A wonderful aromatic, easy growing orchid that requires little attention. I had tied it to a wood mount and I have it (along with 10 or so divisions) to this day. It faithfully blooms in the late summer and has the most delicious scent. *Brassavola subulifolia* is also more commonly known as *Brassavola cordata* – which means heart-shaped and is describing the flat heart shaped lip/labellum of this delightful orchid. I recommend it highly to anyone that grows in hot to warm conditions as it makes a great addition to a collection. Thanks to Allen Black for use of his photos.



Brassavola subulifolia (syn. *Brassavola cordata*)



Brassavola subulifolia



Caularthron bicornutum

At about the same time I visited the nursery of Fred Fuchs, a legendary Orchid nurseryman in Homestead, Florida who passed away in the eighties. Many orchid species (i.e. *Catasetum fuchsii*) bear his name and he was an avid traveller to find orchids around the world. I am honoured to have met him before he passed and when I was with him he suggested that I buy a ***Caularthron bicornutum*** from him that he had just gotten in from Venezuela. *Caularthron bicornutum* is a larger hot to warm growing orchid that is related to *Cattleya*. They are often found on coastlines near or at seaside and for this reason it grows well for me. It is very salt tolerant and since I live within metres of the ocean's edge, this is a plus. Even when this orchid was inundated by salt water in the tidal surge of Hurricane Wilma it was one of the few that kept on living as if nothing had happened. It has beautiful star-shaped white flowers with an interesting lip. It is an easy orchid to get to bloom and I have shown it in most every Key West Orchid Society show that we have had in the first week of March over the years. It always gets an award as it most always has at least 15, 60cm long spikes with 3 or so flowers open on each one and many more to successively open over a couple of months. This is an easy plant to grow in a pot and needs little other than a lot of sun and regular year round fertilising.

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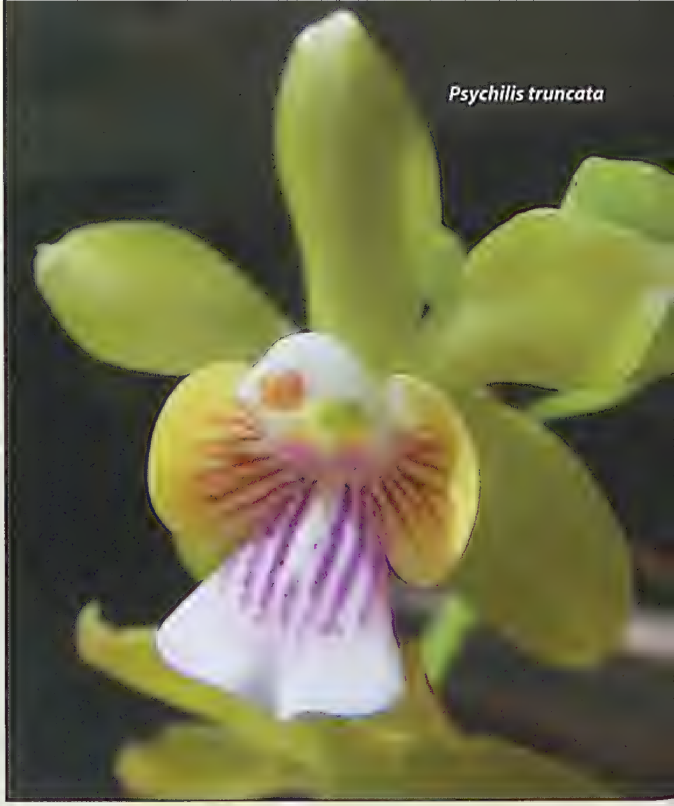
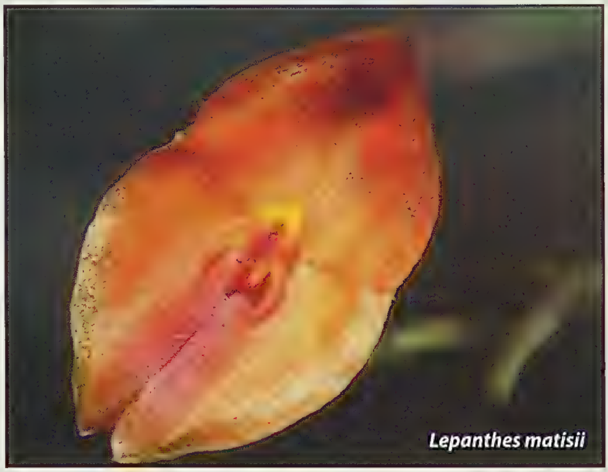
Miniature orchids are always extra interesting to me. I love their interesting forms and there is something charming about their intricate flowers. One of my favourites in this group of orchids is ***Psychilis truncata*** which interesting enough is also related to *Cattleya*. I collected this orchid in the Dominican Republic. It was on a dry rock cliffside about 10 metres above the ground. I could see the spike sticking out over the edge with 2 little flowers against the clear blue sky. It was irresistible and against all caution I started to climb the rock face. After a bit I arrived at its ledge and saw the petite plant with its narrow fusiform pseudobulbs and its metre long inflorescence. I started to detach it from the bush it was on when a wasp-like (I am not really sure what it was) insect began to repeatedly sting my leg, bam and then bam again. It was all I could do to hang on, plus at the same moment my pants split open as I scrambled to keep from falling and all was hanging out for all my friends to view below. Not a pretty moment! Anyway I managed to get down to the ground without falling and I still had the little plant in my hand. I have it to this day and it regularly blooms for me in the spring. The blooms last for almost 2 months and it has a wonderful scent. I love this orchids petals as they are striped and really set off the flower as something different. This one is also a hot-growing, bright-light orchid so it does well for me here in the Keys.

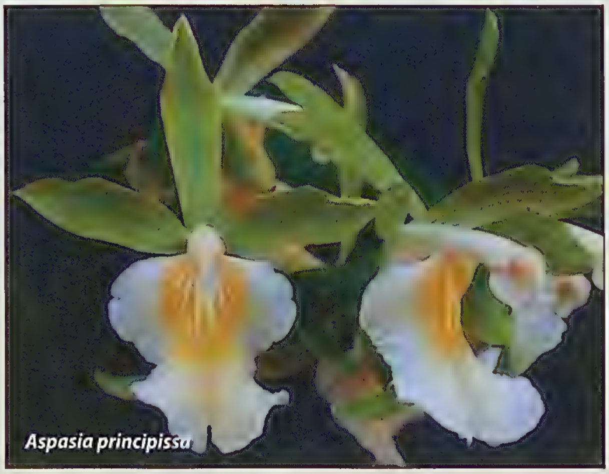
I go to Colombia regularly, as my wife is from there. I am always bored with life in Bogota as we live in a small town in Florida and Bogota is not. If I have free time I head out to a spot just inside the city limits that has an ancient house and a valley behind it that has a spring. There are not many streams in this area so the site is a bit unique. In it there is a miniature orchid from the *Lepanthes* genus, it grows in the ravines next to the stream in a cloud forest on thin branches and smaller trunks of large bushes underneath old growth forest on embankments. This *Lepanthes* has flowers as large as *Lepanthes escobariana* but I had never seen a photo nor read anything about it. I found it strange that a large flowered (for the genus) *Lepanthes* would not be present in some orchid publication. For years I had asked the Colombian orchidists if they thought that it was different and what it may be. Their answer was always that it was a species that had been described years before, but they could never remember what that name was. After showing it to Lisa Thoerle and Father Padre Ortiz in June of 2009 they investigated further and found that it had been illustrated correctly in 1803 but erroneously given the name of *Lepanthes costata*, another species that has tailed sepals which this one does not. Lisa and Padre Ortiz then wrote up a new description with the name ***Lepanthes matisii***, named after the artist that drew it in 1803, and they cited me as the discoverer. As this species grows at elevations around 2800 to 3000 metres I cannot even begin to think that I could grow it in Key West so I have never tried. I just love the spider-shaped petals and lip in the centre of the flower. I have visited this spot at several times during the year and it has always been in bloom so I assume that it is almost ever-blooming.

An orchid that I can grow that does well for me in hot, salty air conditions is ***Aspasia principissa*** which hails from Costa Rica, Panama and Colombia at lower elevations. I love this orchid because it is long lasting (almost 3 months) and the flowers have a delicious scent. It requires regular watering and fertiliser year round so it is very easy to keep alive.

The last orchid that I am going to write about is the most famous. I cannot grow it as it requires a lot of special care and it does not like hot, salty air is "The Ghost Orchid" - ***Polyradicion lindenii***, aka *Polyrrhiza lindenii*, aka *Dendrophyllax lindenii*.


Psychilis truncata


Lepanthes matisii


Aspasia principissa

I can't get used to calling it *Dendrophyllax lindenii* because it is not similar to the others in this genus. It is fantastically large and has a decided leaping frog aspect to it. In Florida it is quite rare and has been the subject of books, *The Orchid Thief* and a movie, *Adaptation*. Several years ago I went to the Fakahatchee swamp and jumped in and waded to the site where this orchid occurs. I was there in time to see it bloom and was amazed by its size and beauty. A really fantastic sight to see and quite interesting to encounter in its swampy domain - that also includes alligators and Florida panthers not to mention several types of poisonous snakes.

It was not easy to come up with these favourite orchids as there are so many that grab my attention, but these stand out in my mind as special. ■

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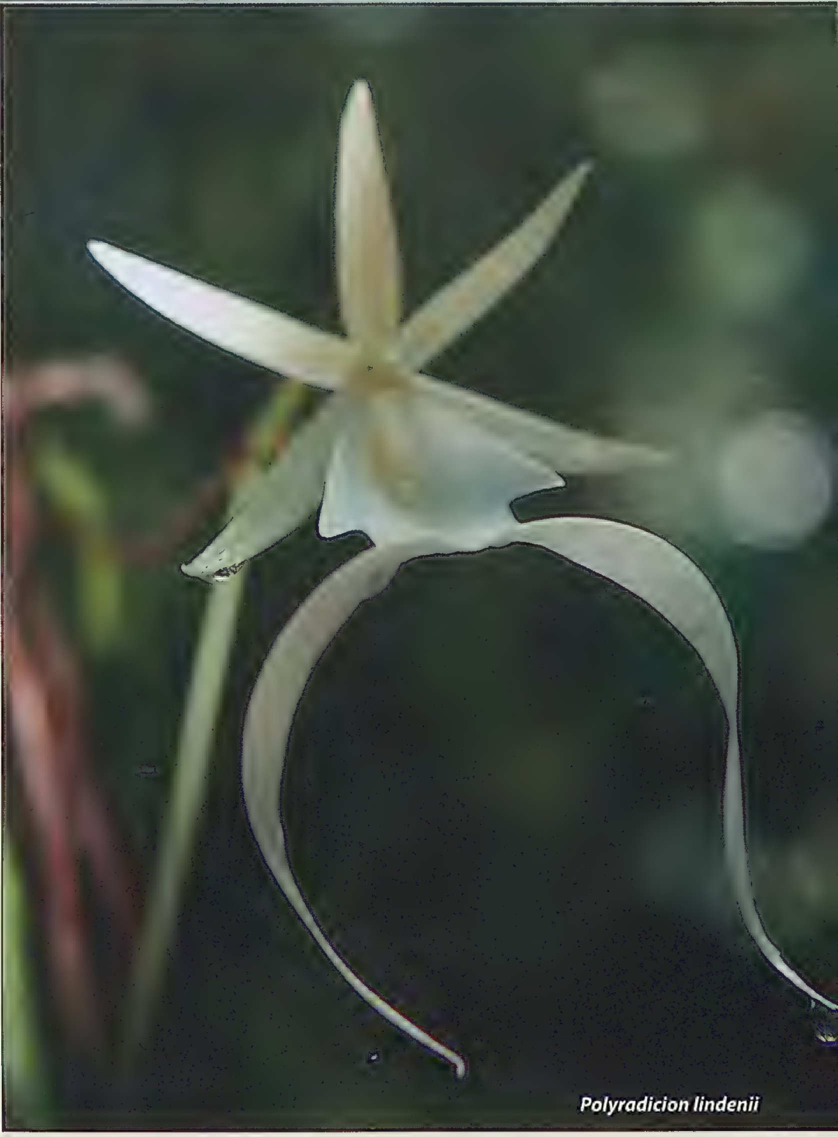
Jay Pfahl in 2011


Polyradicion lindenii

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Dendrobium Adele's Carnival

Growing "Softcane" Dendrobiums

by Eric and Dorothy Collins

In our efforts to grow our orchids to perfection we must first decide on one of two things. Do we try and copy nature and grow our plants as close as possible to how they grow in the wild? Or, do we try and improve on nature and find a better way?

If your answer is yes to the first question then you must follow current thinking and stay within the norm. If on the other hand you wish to improve your culture well beyond nature and find a better way, you must be prepared to experiment and take chances.

We decided on the second option and believe me, watching an idea succeed is far better than seeing a plant flower for the first time for you. The way ahead can be full of frustration, but can also produce some pleasant moments, both planned and otherwise, and oh! forget perfection, it is too easy for someone to come along and move the goal posts.

Sandy Anderson, who with his wife Olive, traded as Bananacoast Orchids for a number of years at Coffs Harbour and imported many fine Yamamoto Softcane *Dendrobium* hybrids. He once wrote in an article that he had seen two collections of Softcane Dendrobiums by hanging them undercover and above Cattleyas to supply extra shading.

So ended our first attempt to grow Softcane Dendrobiums, one of those collections was ours.

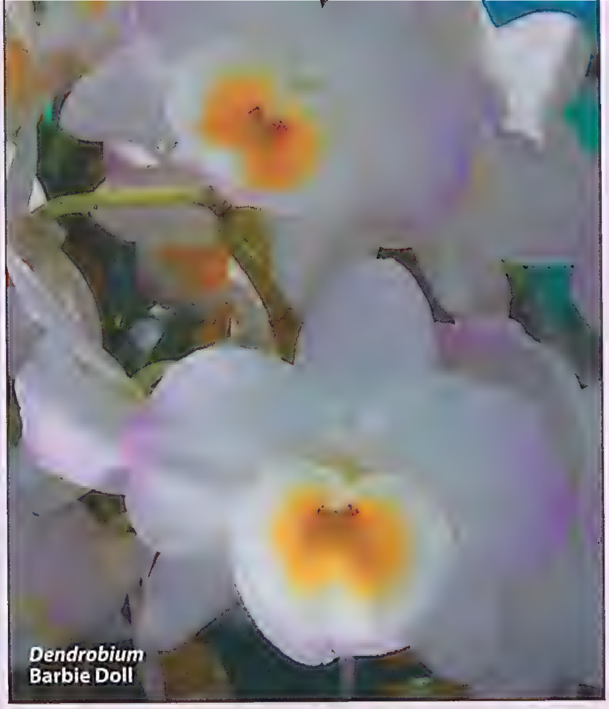
Not to be put off by this early failure almost 30 years ago and supplied with good advice from Sandy, for which we have been ever grateful, we pressed on and started to grow our Softcanes with some success. These plants make up the section *Dendrobium* of the genus *Dendrobium* – essentially these are the "true" Dendrobiums. I have retained the common name Softcane here because of its common and widespread use.

In the year 2000 we had to sell our home on a large block and bought another on a half block which required little maintenance. This move saw our orchid house reduced from 120 square metres to just 35 square metres and our orchid collection reduced to suit. Once settled in and all new home adjustments made we turned to our orchid collection and the decision was made to concentrate much of our effort on our Softcanes.

With this decision made I started to keep a log book in which I would record weather conditions, high and low temperatures, cloud cover, rainfall etc. and culture factors like fertiliser applications and more. This book would record all things that I considered would have some impact on our plants, it was to prove an invaluable tool where I could look back on conditions and culture etc. for any given time. The following thoughts and culture applies in our collection mainly to hybrids, however we do have several species which also grow and flower with no trouble.

Softcane Dendrobiums are not the type of orchid that you can grow just a few in a mixed collection unless it is a very small collection where each plant is given its own attention separately. In general they require their own area where they can get their own type of culture and any other orchids grown with them must be able to grow in those conditions.

In saying this it might seem that Softcanes require a complicated culture but nothing could be further from the truth as their requirements are simple, just different to other orchids. It should be noted also, that the name Softcane can be a bit misleading as these plants are not soft by any means, although they may sometimes appear so, in fact they are the toughest, most resilient plants we have ever grown, provided they receive the right culture. The other thing is that they do not have true canes, what is referred to as a cane is in fact an elongated pseudobulb, as orchids do not have true bulbs.


Dendrobium
Barbie Doll

Dendrobium
Blackstar

A season in the life of a Softcane is about 15 months long and seasons overlap each year, starting in winter when the new growths first appear. These new growths progress slowly until the plant flowers, when they appear to stop growing, at this time they are usually several centimetres tall. When flowering finishes growth recommences its progress. This is the time to start fertilising with a fertiliser containing a moderate amount of nitrogen along with a balanced supply of all other elements.

As the weather warms, both water and fertiliser can be increased in frequency. We mix our own fertiliser from basic ingredients and when we adjusted amounts several years ago we determined an amount to be used for optimum results. Since then we have doubled this amount and use it at every watering which may seem extreme but allowing for wet, colder or cloudy days is not as much as may be thought.

January is usually the month we start staking the developing growths, but as our culture has improved we have found that we stake less for support, most of our staking now is to better display the flowers. By the end of February we stop using fertiliser containing nitrogen and convert to one with no nitrogen at all. This fertiliser contains all the other usual ingredients, potassium, phosphorus, magnesium etc. through to the trace elements and is applied through the colder months until about mid October, again at every watering.

Using this fertiliser through the colder months will assist with the development of flowers, it can give you bigger flowers, better substance, texture and colour and I believe even better shape. I don't think it will increase flower count as my thoughts are that this is determined earlier in the growth stage of the plants.

As the weather starts to cool in autumn we continue watering as needed by the plants as it is at this time of year that the pseudobulbs will fatten up putting on condition. This will see the plants through winter and flowering in spring, and a good supply of water is essential for this to happen.

Bud initiation has been, to us, an important phase to study, Yamamoto has stated that these plants require 30 nights of below 10°C to initiate flowering. Sandy wrote that he thought the same time frame, but below 13°C was sufficient. With our close monitoring we first notice bud nodes 14 days after temperatures of sub 15°C.

As nursery operators these people were possibly generalising when they quoted these figures and here I am offering the results of our recorded observations. As the season progresses the weather continues to get colder and more and more of our plants show bud swell and within two to three weeks of those first plants showing nodes they are common throughout our collection.

Dendrobium Come Undone 'A1'

It has been stated that winter is a time of rest for Softcanes and also that these plants require a winter rest to flower in spring. I have already stated that buds are first visible after 14 nights below 15°C, long before any rest has been achieved. We have also observed root growth throughout winter on these plants with temperatures as low as zero and constantly between 5 and 10 degrees C.

If plants are initiating and growing flower buds then this is not rest, if they are growing roots then this also is not rest. Rest – is defined as "A state of quite: cessation of motion, labour or action of any kind, release of exertion or action." I now prefer to look on winter as a time of Metamorphosis, - again defined as "A marked change in the form or structure of a living body."

At summers end, Softcanes are quite ordinary looking green plants, by winters end they emerge covered in flowers of many different colours. Just as a caterpillar emerges his cocoon a beautiful butterfly, surely there must be a comparison.

Some authors (generally in northern hemisphere countries) also state that Softcanes require a dry winters rest - meaning little or no water, fertiliser or both. These are a little more specific in their meaning and don't imply complete rest however I don't accept these lines of thought at all either as I believe growth of any kind will require both water and nourishment to sustain it. If these things are not supplied then the plant must take them from its reserves, something I don't like to see if it can be avoided.

We are told that there is little or no rain in winter where these plants come from, that is fair enough but there must surely be mist, dew, fog or low cloud, even substantial temperature fluctuations between night and day in these mainly mountainous areas and where an orchid is growing on deciduous trees with its roots exposed it would get some moisture from these. As I have stated these plants are doing something right through winter, so we keep up a program of both watering and no nitrogen fertiliser. Obviously they won't require these commodities at anything like the summer rates, but we water as we would other orchids and again fertilise at every watering.

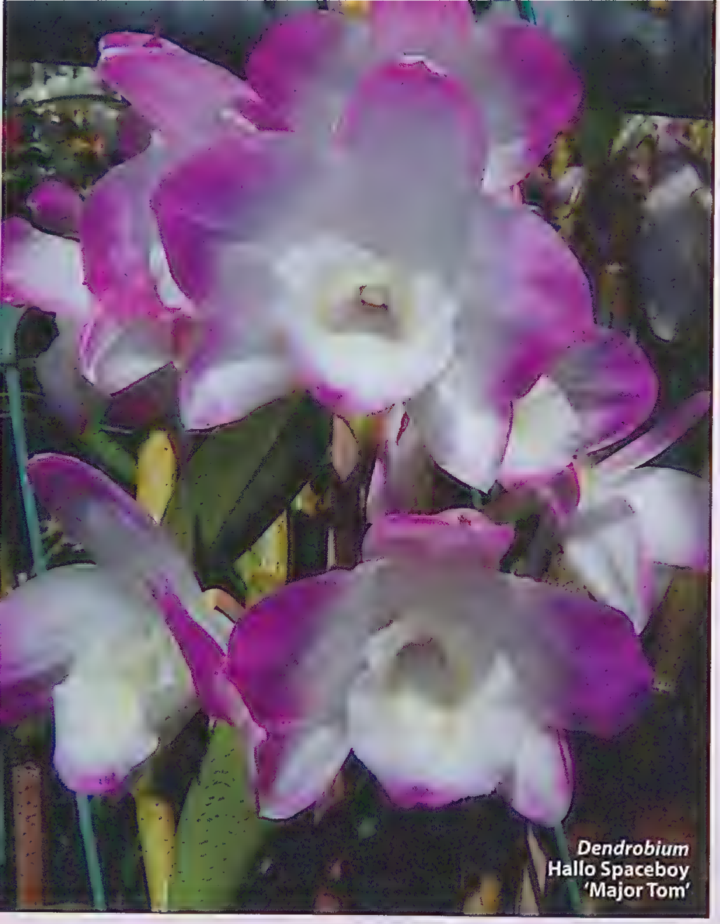
Another thing I first heard about 30 years ago, is that if you water Softcanes in winter they will produce aerial growths at the expense of flowers. The authors of this nonsense even stated that if they receive natural rain then that was alright. We catch our rainwater off an Alsynite roof and it is stored in a series of plastic drums, if this rain falls on our plants direct then this is alright but if I pump onto them later it will cause problems, I don't think so, in fact I'm sure it won't!

To those people who say their town water contains chemicals and/or minerals that may cause their Softcanes to grow aerials at the expense of flowers I say, 'put in a small tank and pump so you can catch your own water, your orchids will love you for it'. Considering the monetary outlay many growers put out on their orchids the price of a storage system and pump would not be great.

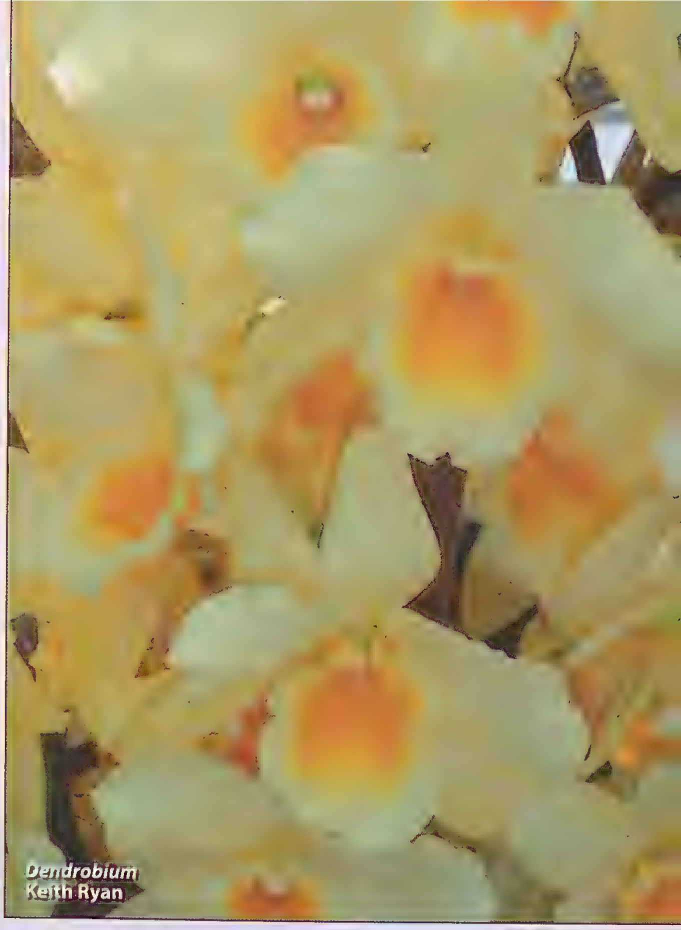
We believe the perfect pots for Softcanes to be a range of three sizes, 75mm, 90mm and 110mm and about 150mm to 180mm deep. They should have a waterwell built into them about 15mm to 20mm deep. These sizes have come about from our experiments with plastic bottles, chiefly one litre milk bottles that have proved themselves to be great containers and last for several years in serviceable condition, even longer if one took the trouble to paint them.

These pots are made by cutting the top of the milk bottle off at the shoulder, punching four 12mm holes in the side 15mm to 20mm up from the bottom and cutting a smaller hole in the lid. After trimming, the top is dropped into the created pot, a water well and a dome has now has been created in a pot that measures about 160mm deep and 75mm diameter.

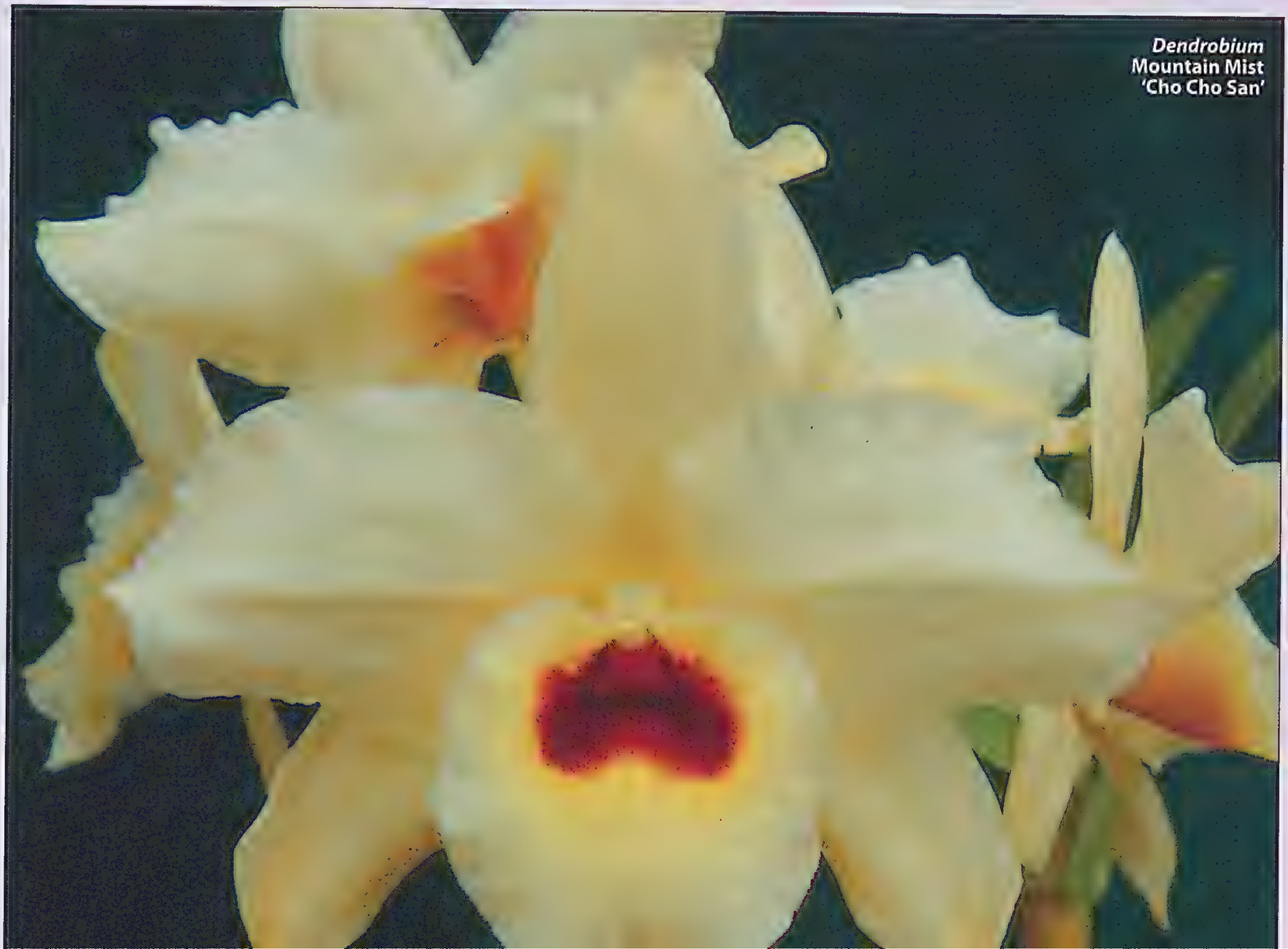
Dendrobium
Golden Crown
'Sunset'



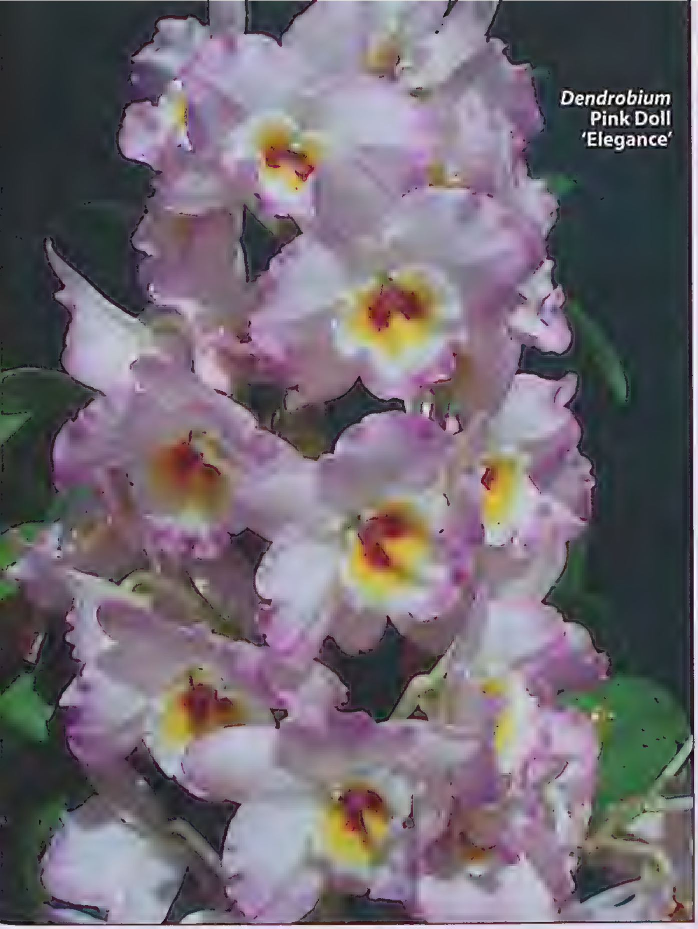
Dendrobium
Hallo Spaceboy
'Major Tom'



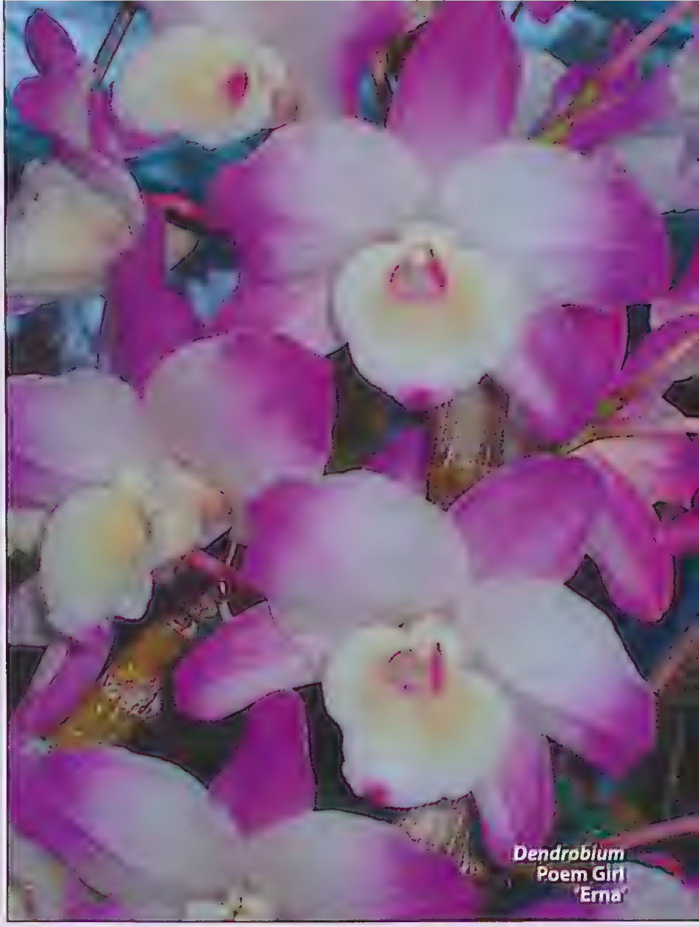
Dendrobium
Keith Ryan



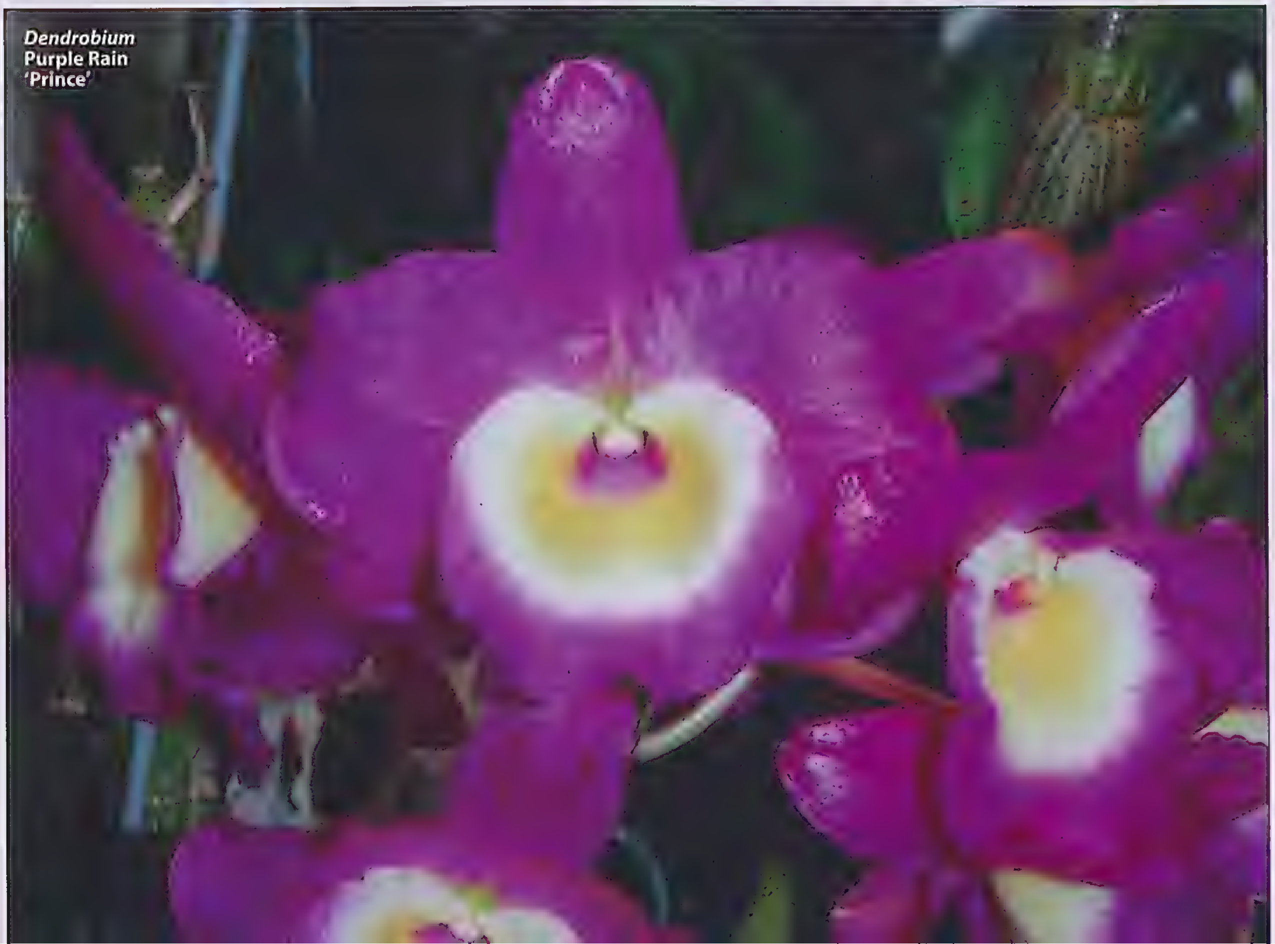
Dendrobium
Mountain Mist
'Cho Cho San'



Dendrobium
Pink Doll
'Elegance'



Dendrobium
Poem Girl
'Erna'



Dendrobium
Purple Rain
'Prince'

Dendrobium Snow Boy 'Romance'

We pot up aerials that are reasonably well developed directly into this pot, and they soon become established and will grow on to flowering without becoming constricted for space. Several years ago I removed some aerials in July and potted them up to see what would happen, these plants didn't look back. So I tried a couple each two months and soon found that July and August to be the best time of year for this practice. These plants have active roots and by spring are well established in their pots.

We use a mix of about 50:50 OrchidMate coconut chip 6mm to 20mm and course to very course perlite, with about another 10% ground styrene added, this mix holds water well and is quite open enough for these orchids. When we pot a plant we give it a top dress of Blood and Bone to which we have added 15% by amount of Sulphate of Potash. We have also had good results with this Blood and Bone mix by giving our plants a top dressing in November but have found that any more than this may cause problems of clogging the potting mix.

Softcanes will tolerate a very wide range of light and temperatures. We grow plants both in an orchid house with a cover of 30% shadecloth and in the open where they receive full sun, they will grow in a house with 50% shade but we believe 30% to give the best results for us.

We have experienced winter lows to 0°C and summer highs to 41°C - with the high temperatures measured in the orchid house out of direct sunlight. I have no idea how hot those plants in the open were but they all came through without problem. I must add that no plant should be moved to an area of higher light in hotter weather, this should only be done in winter.

These are plants that require plenty of water, especially in warmer weather and the hotter the weather the more water needed. This is where our waterwell pots come in handy as they can help reduce water required.

Dendrobium Super Star 'Magenta'

Dendrobium Star Sapphire

Dendrobium **Stockton Choice 'Catriona'**

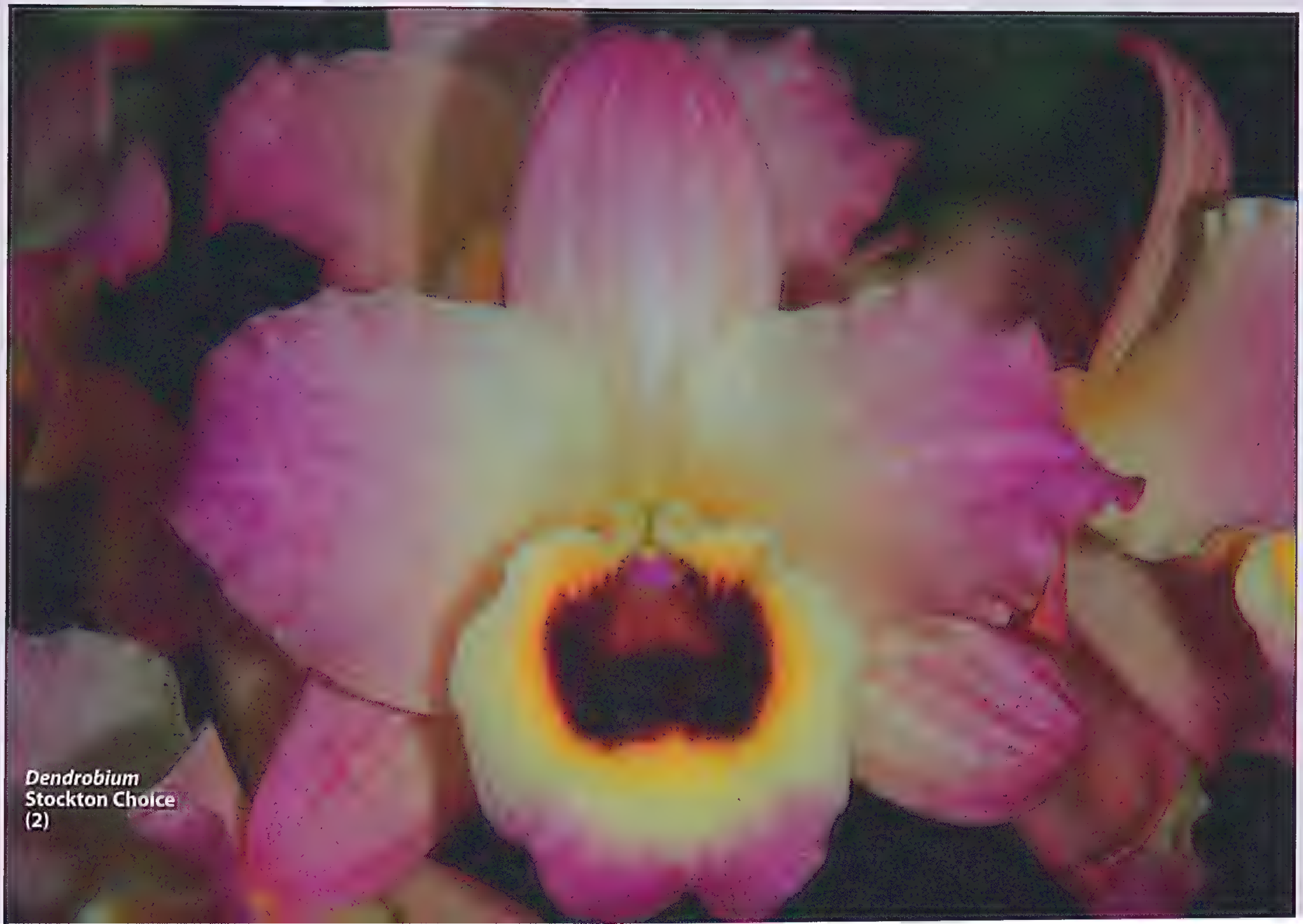
Our water storage is a series of 200 litre plastic drums which are connected at ground level by an 18mm hose and catch water off that part of our orchid house covered by Alsynite. The same hose then connects the drums to a small Davey pressure pump and on to the orchids. 12mm hose is too small for this job as it won't move water fast enough in either direction.

The main thing with this type of system is that all drums must be on the same level but they can be placed remote from each other. The last two drums before our pump have large lids and are 150 litre and 75 litre. It is in these drums that we mix our fertiliser before applying it. The whole watering system is controlled with low pressure drip irrigation taps placed in positions to control that the water goes to where it is needed.

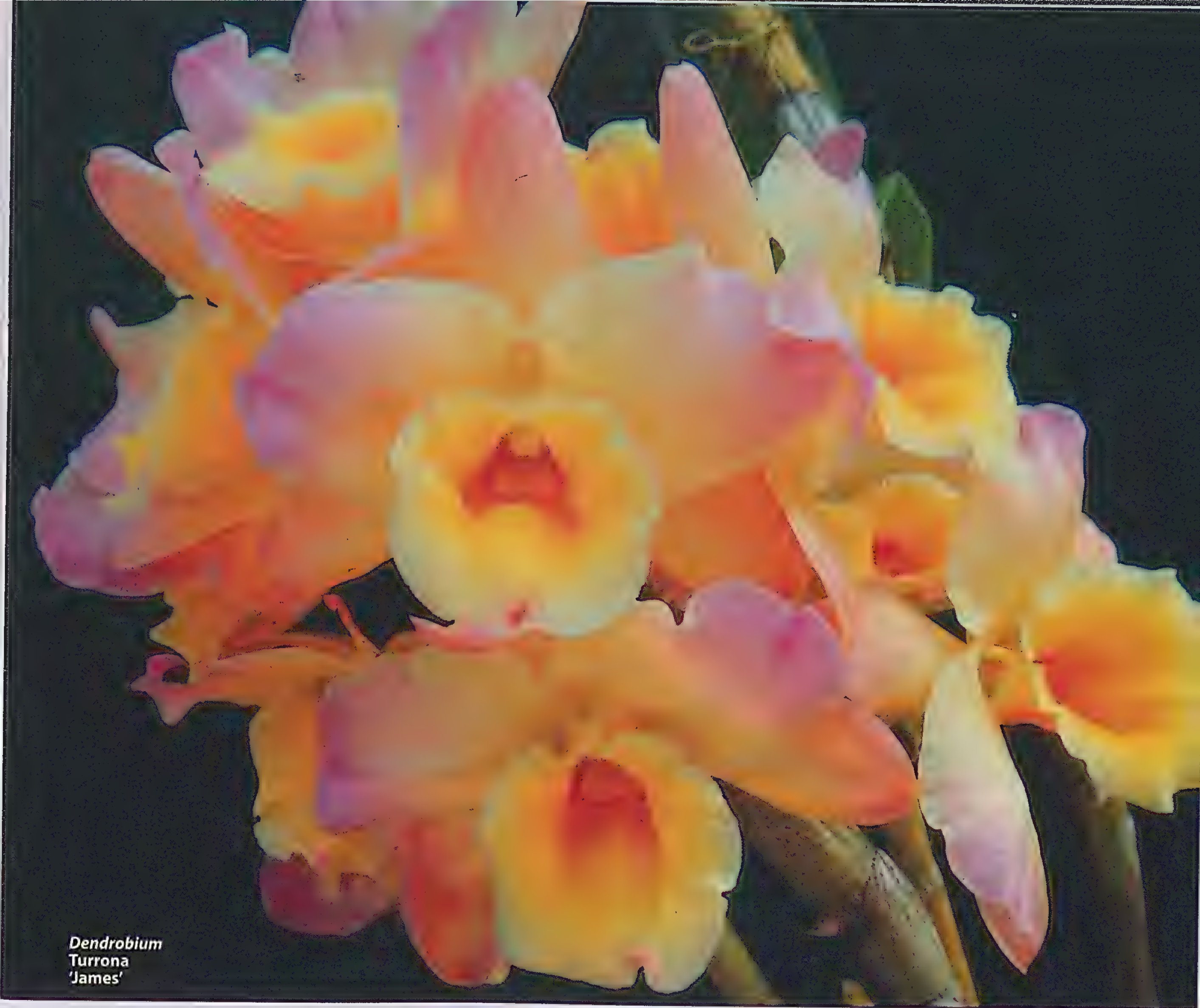
The main reason for writing these notes for the *AOR* is to encourage other growers to give thought to the culture they supply to their orchids. Maybe to occasionally try something a little different, you never know what you may learn, isn't that what it is all about?

(All photographs by David Banks, of plants grown by Hills District Orchids, NSW.)

Eric and Dorothy Collins
Coffs Harbour, NSW
Email: spoulton63@gmail.com



Dendrobium **Stockton Choice (2)**



Dendrobium
Turrona
'James'

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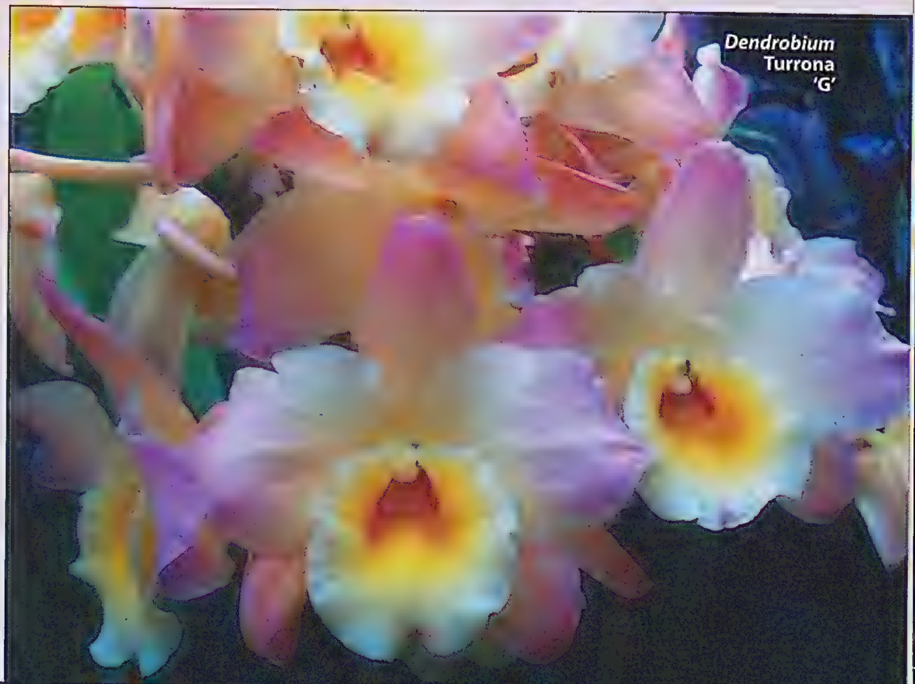
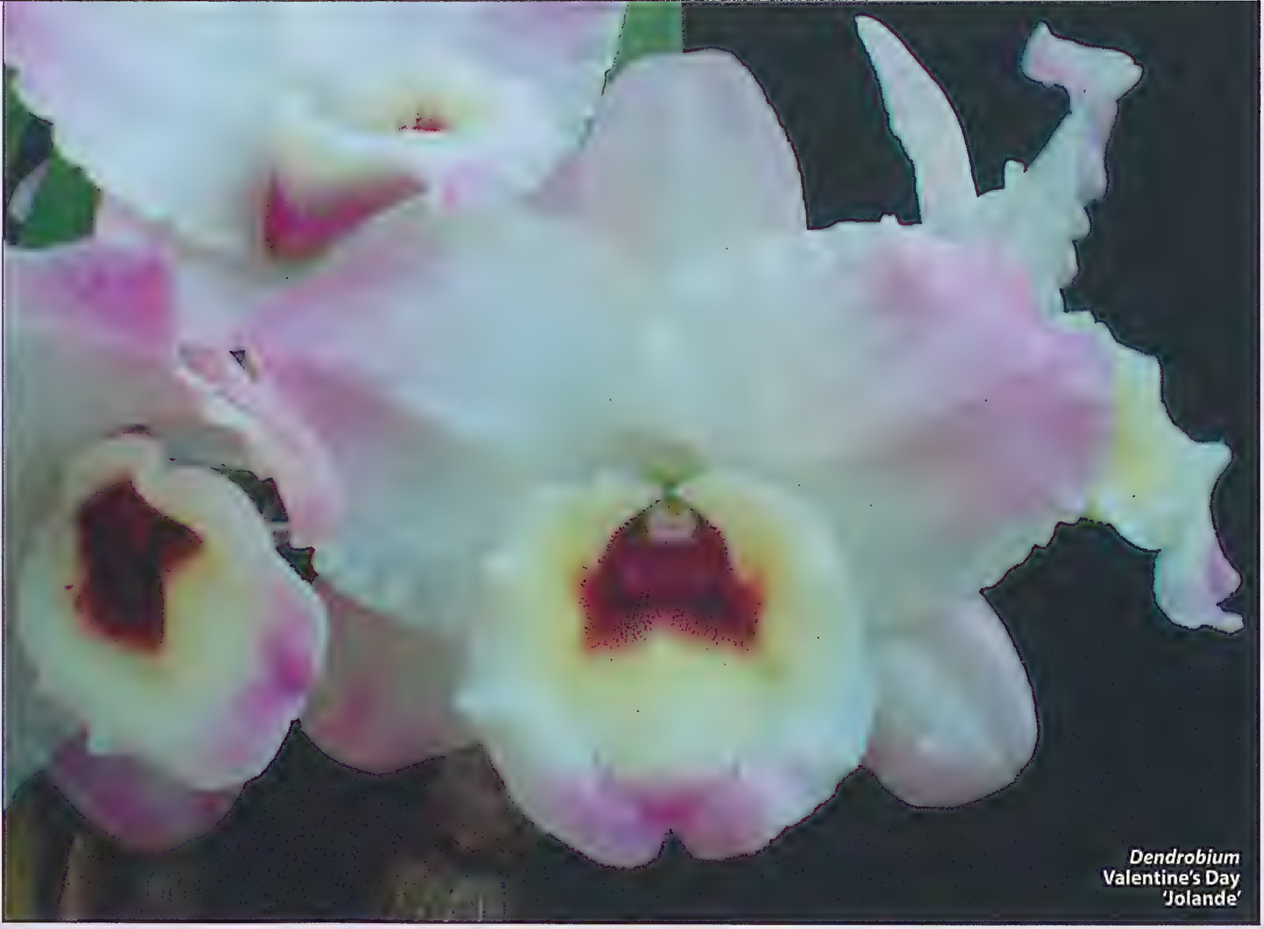
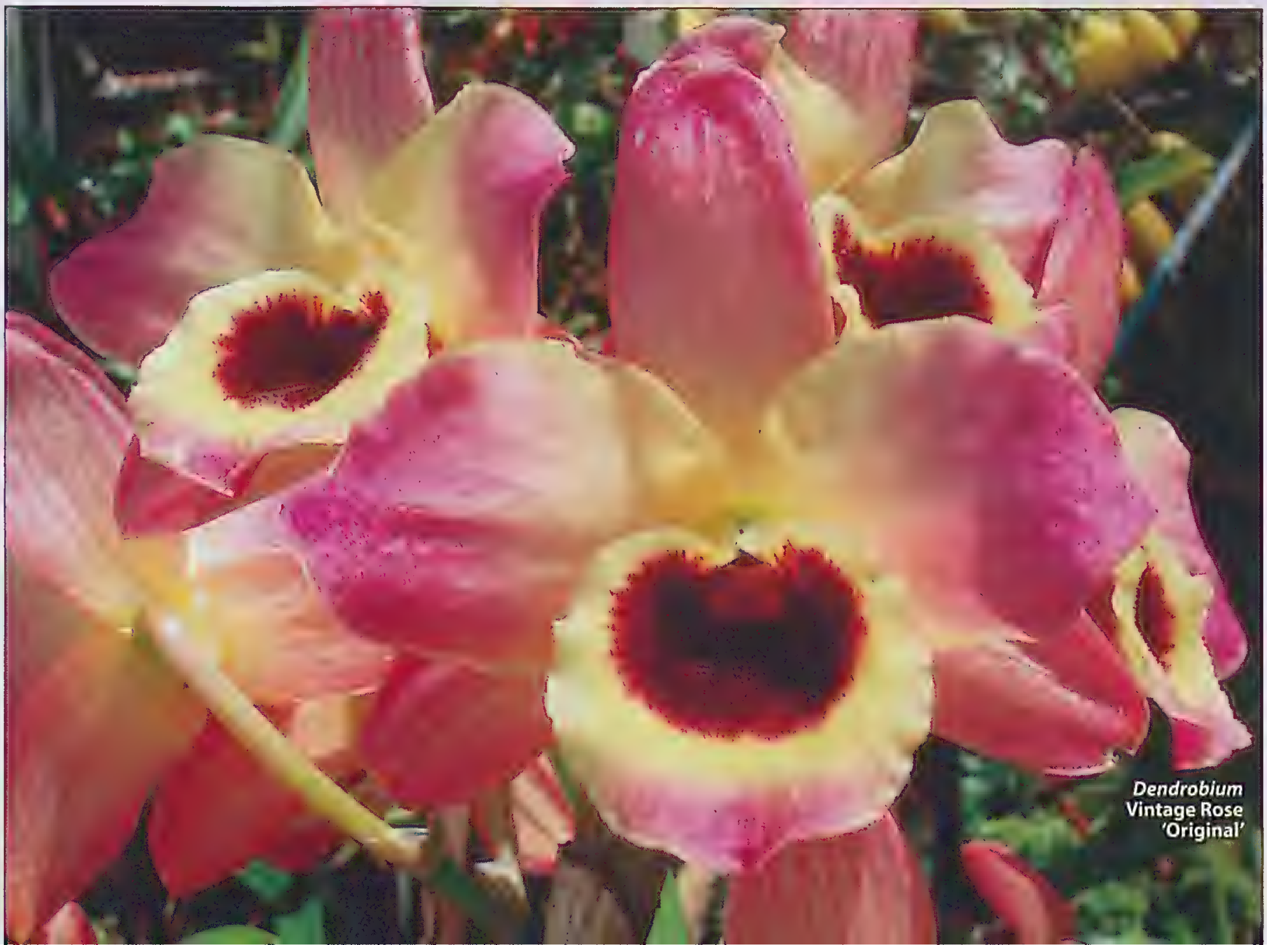


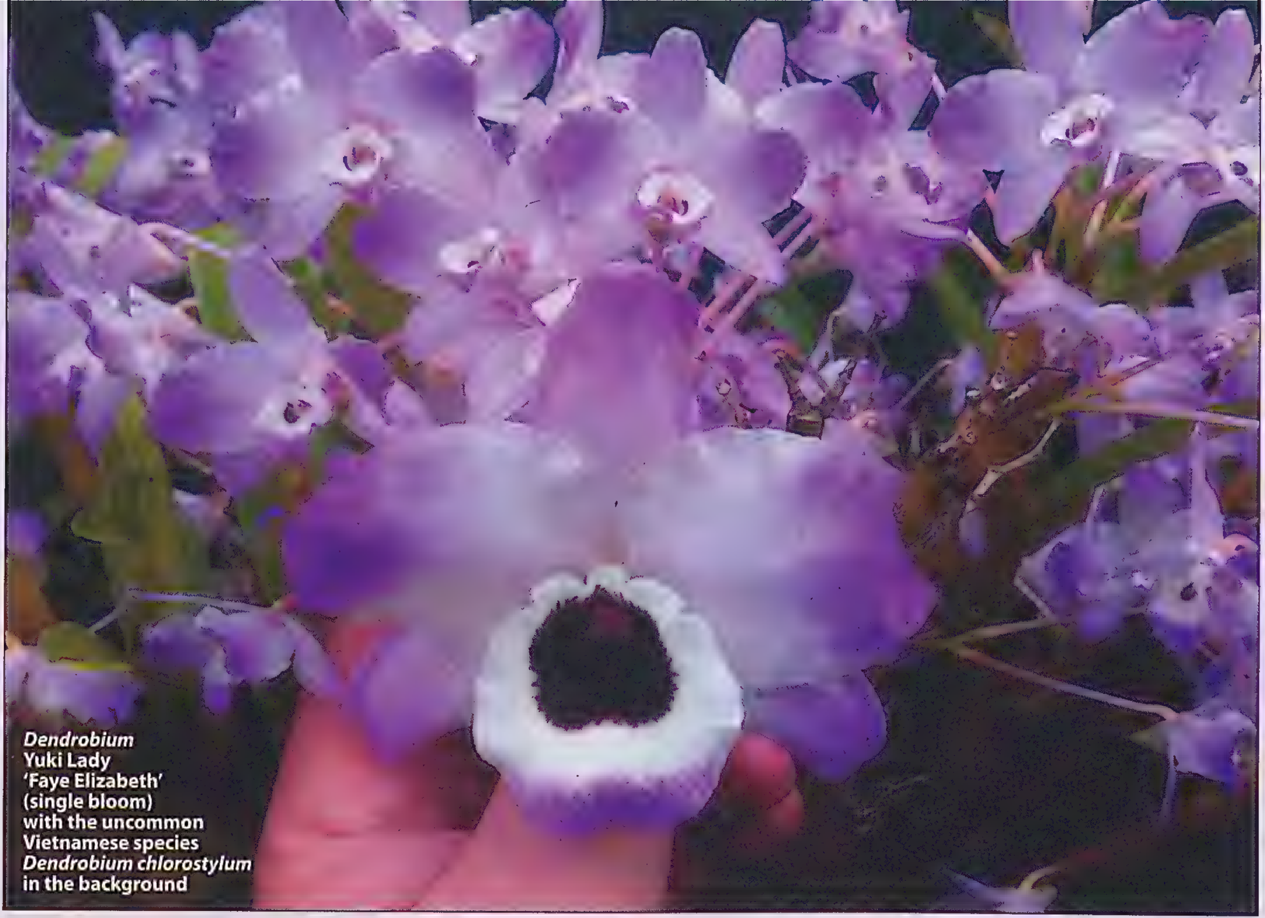
Dendrobium
Turrona
'G'



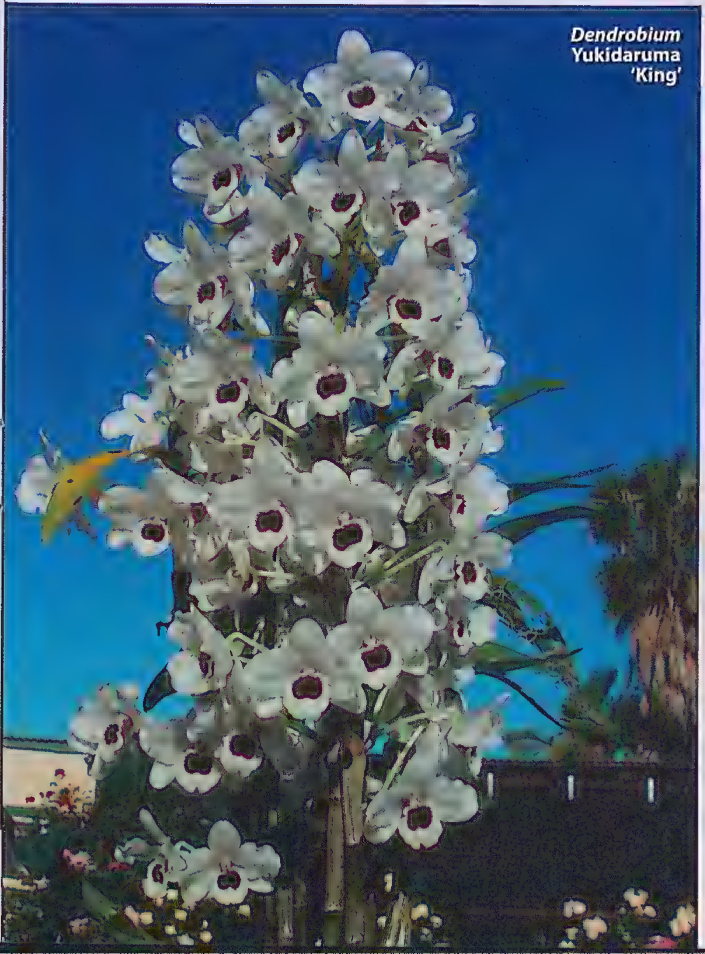
Dendrobium Valentine's Day 'Jolande'



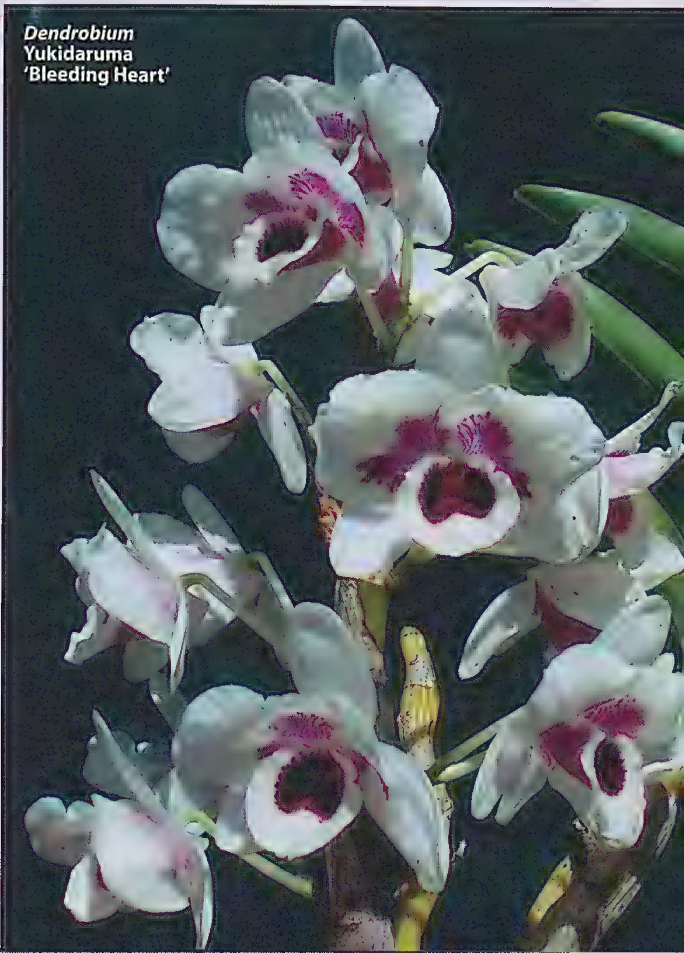
Dendrobium Vintage Rose 'Original'



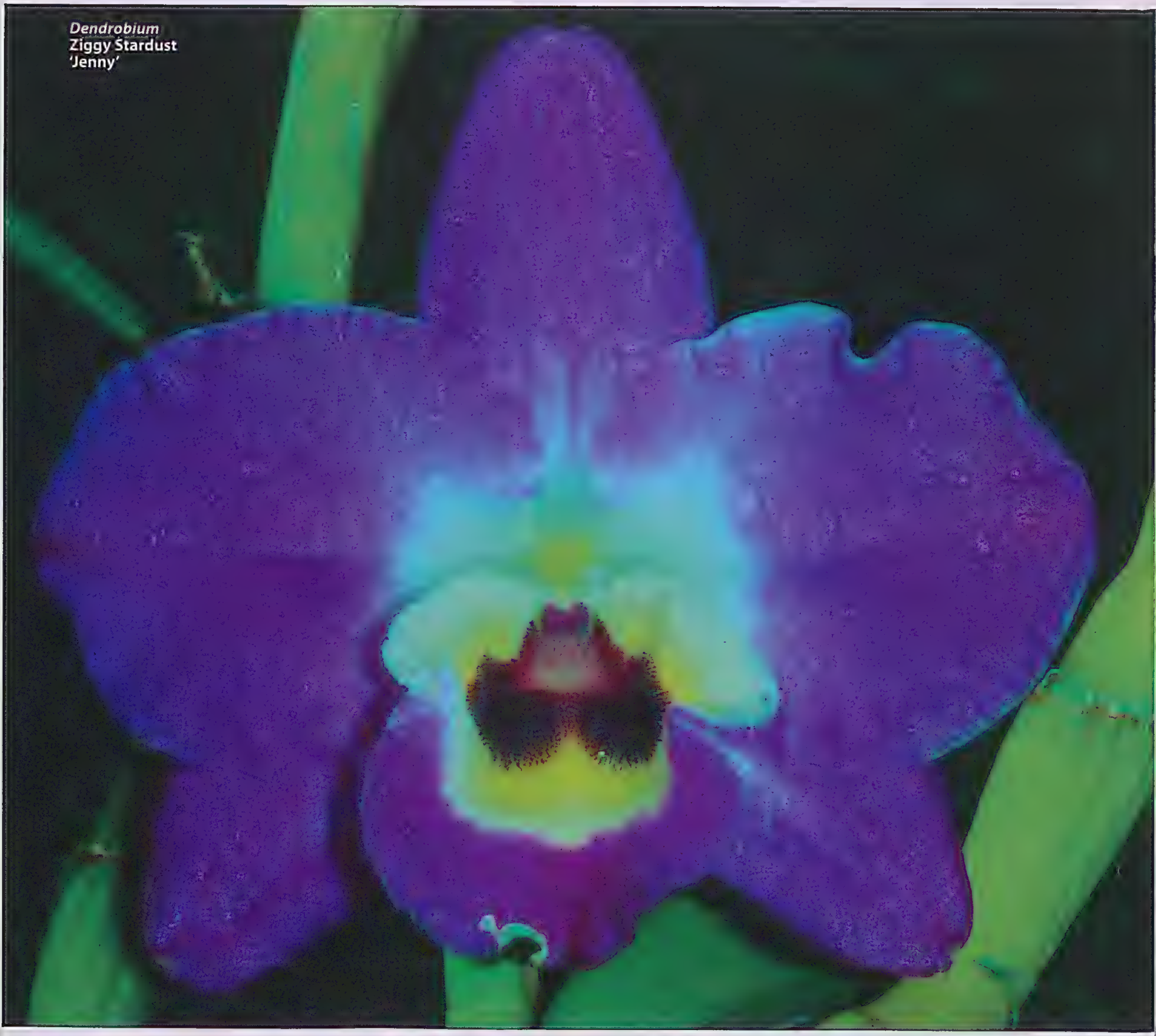
Dendrobium Yuki Lady 'Faye Elizabeth' (single bloom) with the uncommon Vietnamese species *Dendrobium chlorostylum* in the background



Dendrobium Yukidaruma 'King'



Dendrobium Yukidaruma 'Bleeding Heart'



Dendrobium
Ziggy Stardust
'Jenny'

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Trying to save *Diuris aequalis*

Text and photos by Alan W. Stephenson

I first visited this area in October 2005 and because of the obvious environmental issues and the different orchid species I have returned many times and recorded the different and endangered species the area has to offer. The area is Mt. Rae, a locality between Taralga and Crookwell on the New South Wales Southern Tablelands, known for a few sheep but mainly beef cattle.

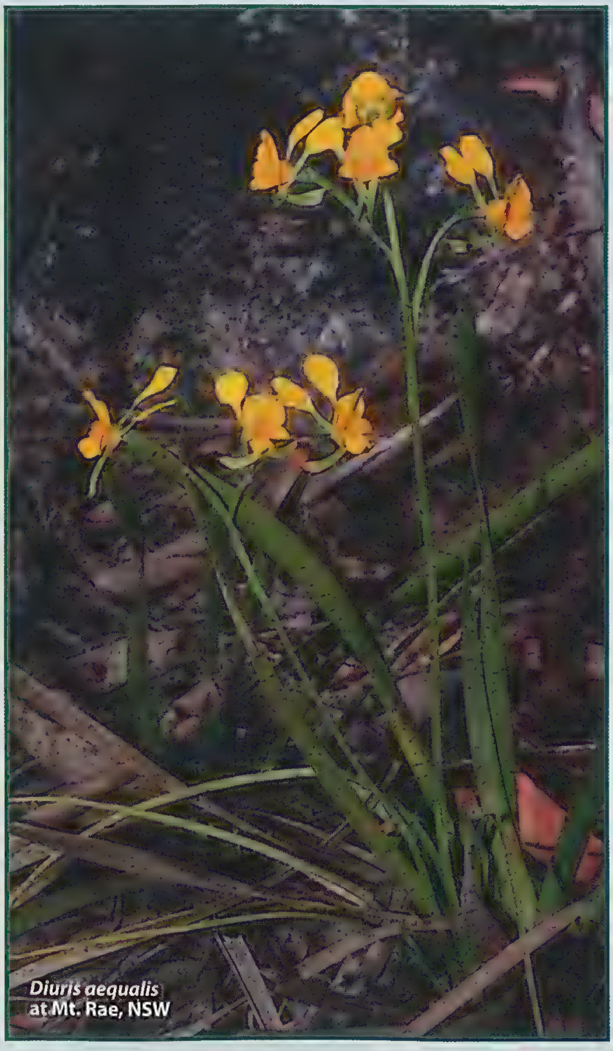
The initial contact was via an email to a Wollongong associate and he said "you can look after this" so I made arrangements to meet the sender of the email and one of his associates who, between them had found and identified *Diuris aequalis*, an endangered terrestrial species commonly known as the Buttercup Doubletail. Their identification was possible via a leaflet distributed by the OEH and their concerns were in regard to wholesale land clearing on surrounding properties for commercial firewood. Dispute still reigns over the classification of the forest being logged but authoritative opinion lists the forest as Southern Tablelands Basalt Forest, which is an Endangered Ecological Community (EEC). However, the firewood logger conveniently had a friend assess the forest as a common type.

The logging, despite at least one endangered orchid being *in situ* and the forest being an EEC as Private Native Forestry overrode the NSW Threatened Species Conservation Act (TSC) and further to this if the land is zoned "rural" the TSC Act did not apply and surveys for endangered species are not required and if an endangered species is located during logging there is no requirement to record the find.

Logging continues to this day, not only on one property but several others as some landowners are weekend visitors only and they can save the cost of clearing by getting the firewood logger to clear their properties and keep the wood as payment. Those who were vocal and objected to the clearing were rewarded by having their letterboxes blown apart by 12-gauge shotgun, although no person has ever been held responsible for the damage. Other reasons for keeping quiet about logging was the threat to one landowner by an associate of the logger that "I will punch out your lights and burn down your house if you open your mouth". Not a friendly environment in which to live a quiet existence on your 80ha lot. On the first day we met while having lunch in the Taralga Hotel, I was told "don't mention wind farms", as jealousy of payments for proposed wind farms was also a cause for local friction.

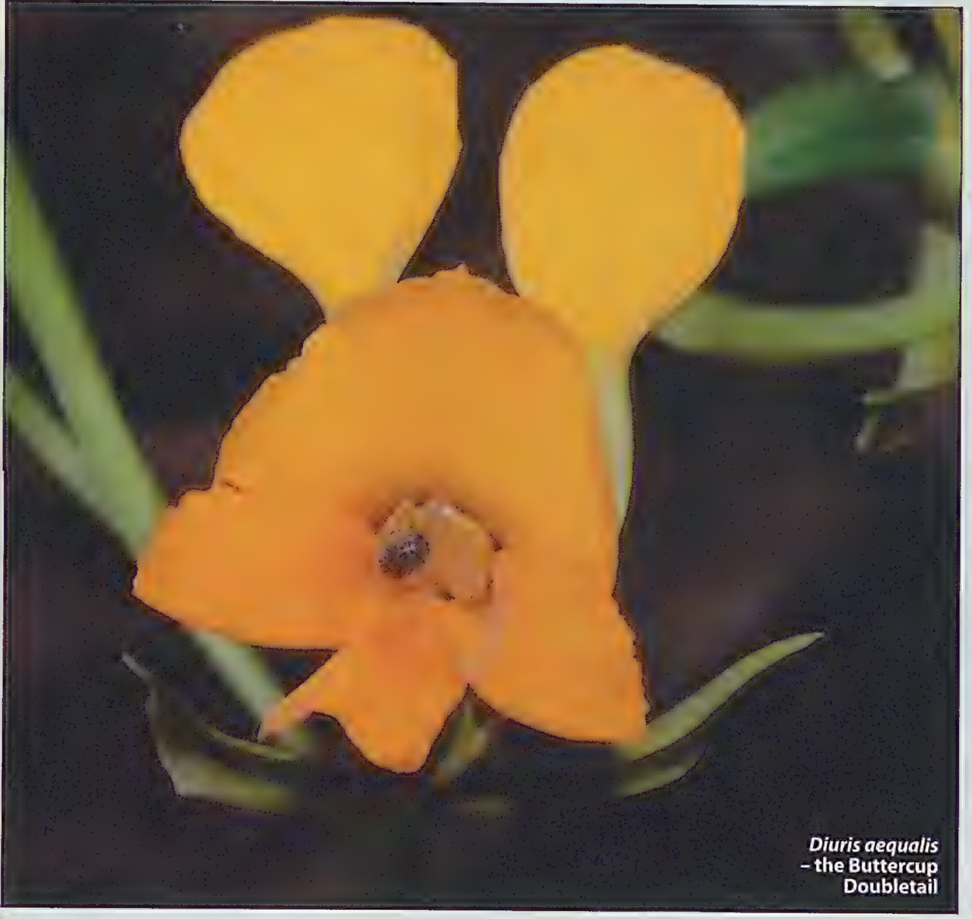
Because the general area ranges from 800 to 1000 metres in altitude, the flora is different and I have managed to identify 21 orchid species on the property I have visited, with *Diuris aequalis* the only endangered orchid but the habitat, altitude and geographic location ensures great differences from coastal species.

This visit saw an increase in the number of wind turbines but little else has changed. On the property I visited the owner and I walked some of the 80ha and found numerous *Petalochilus fuscatus* (syn. *Caladenia fuscata*), several variations of *Stegostyla moschata* (syn. *Caladenia moschata*), *Glossodia major* numerous unflowered plants of *Diuris sulphurea* but no *Diuris aequalis*. Also observed were some yet to flower *Calochilus* species and we saw these the next day at a roadside location which is known to the OEH. I fear for some of these plants as they are centimetres from the road and any roadworks in this section will need to be carefully undertaken as a stray grader or bulldozer blade could destroy a dozen or so of the 200 known plants, as we counted 45 flowering



Diuris aequalis at Mt. Rae, NSW

Diuris aequalis in situ at Mt. Rae, NSW



Diuris aequalis – the Buttercup Doubletail

plants and two with buds. Plants ranged from the few centimetres to four metres from the road edge and are visible to those who know of the population and some orchid observant drivers who may use this dusty road.

The property owner I visit has a Conservation Covenant on his land as do several others but some covenants are not permanent and revert to normal use when the land is sold unless it is continued by a caring new owner. This of course places an additional strain on any population on private property, where many of endangered orchids are located and with the diminishing resources of the OEH, there are insufficient staff to visit these properties and inform their owners as to what environmental values the land may contain. Again, as the current state government is in the process of minimising environmental legislation with the new Biodiversity Legislation, the requirements for landowners to retain trees and maintain habitat is not a priority as when I read through the documents the common thread throughout the document that the landowner was able to make assessments with little required input from qualified persons. I get rather depressed when I see the forest degradation caused firewood logging and the recent construction made on these properties to accommodate trail bike riding and I think of the future damage to water flow over these and adjacent properties as soil erosion is guaranteed along with habitat destruction for rare flora and fauna. Unfortunately, those authorities which could have a positive impact are all too busy allowing unchecked land clearing.

As most of this region still retains some intact forest, I would like this to continue as most existing grazing land was cleared when during the original settling of the area, when knowledge and acceptance of rare species of flora or fauna was minimal and in reality, this is how we came to the situation in which endangered species became an oft spoken phrase. ■

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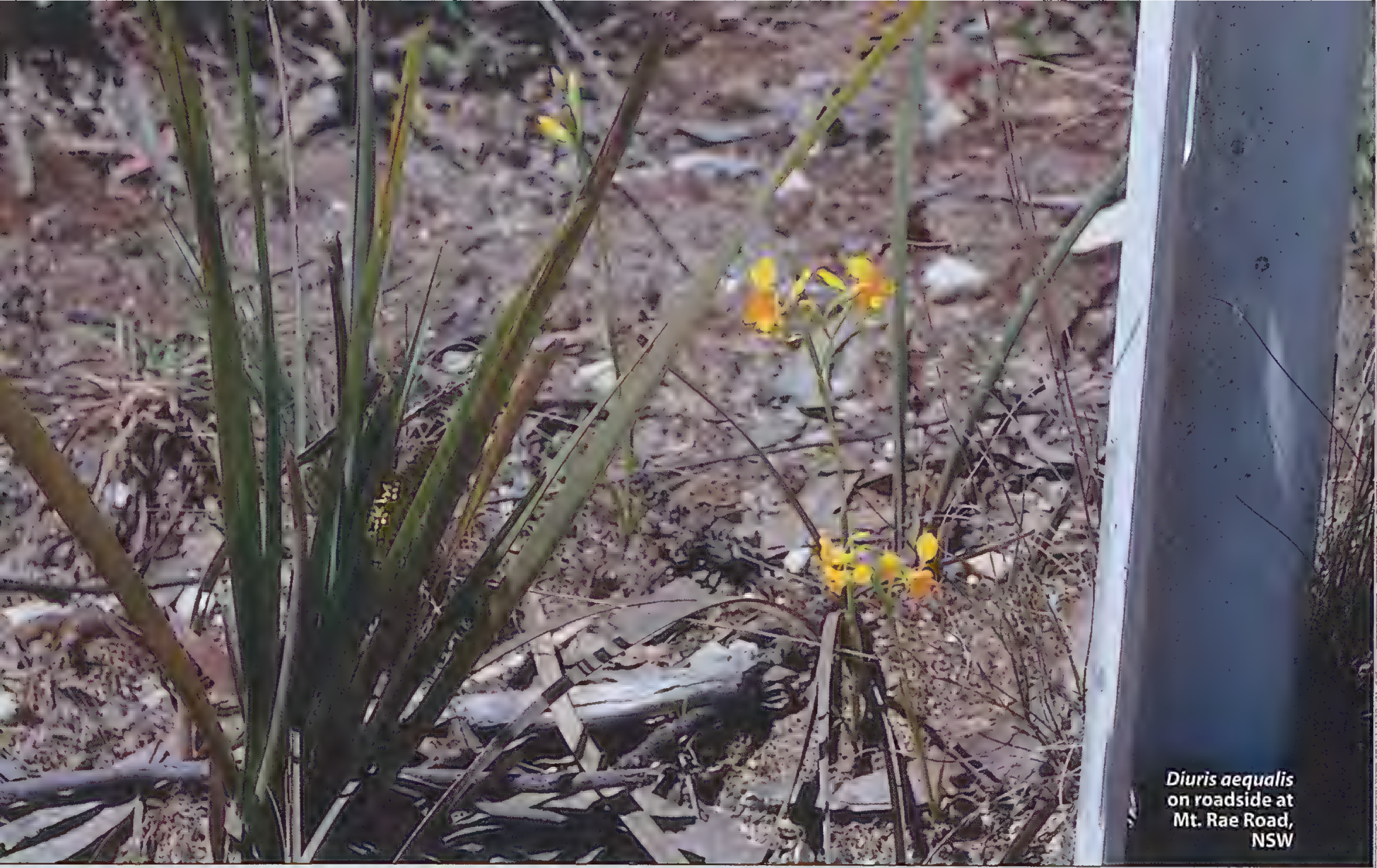
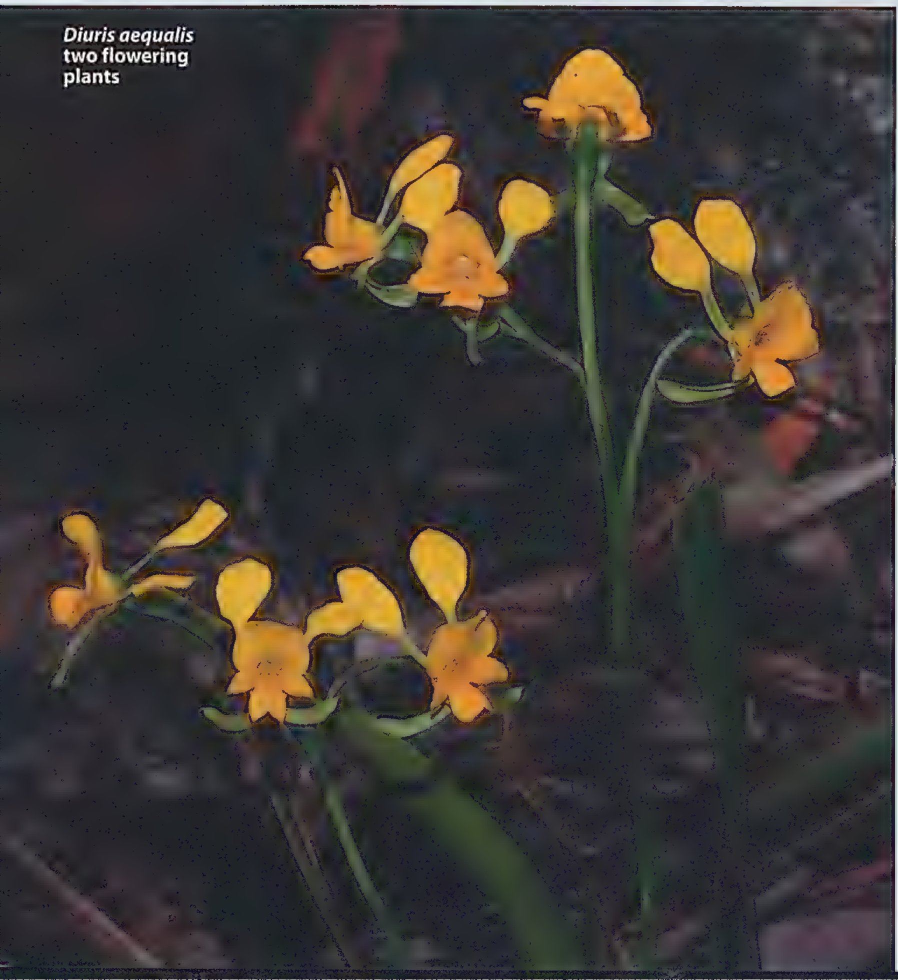


Diuris aequalis on roadside at Mt. Rae Road, NSW



Diuris aequalis two flowering plants

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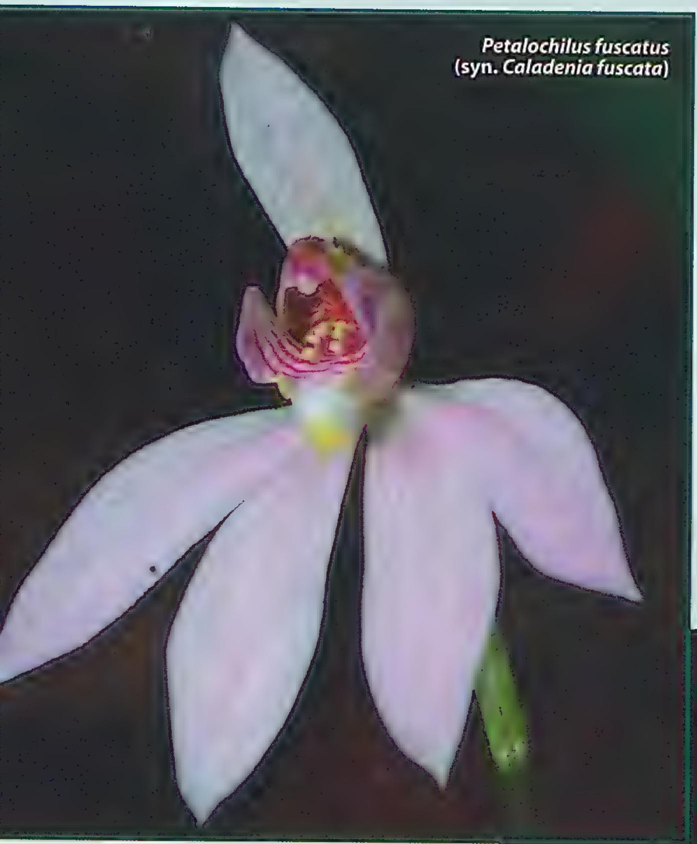
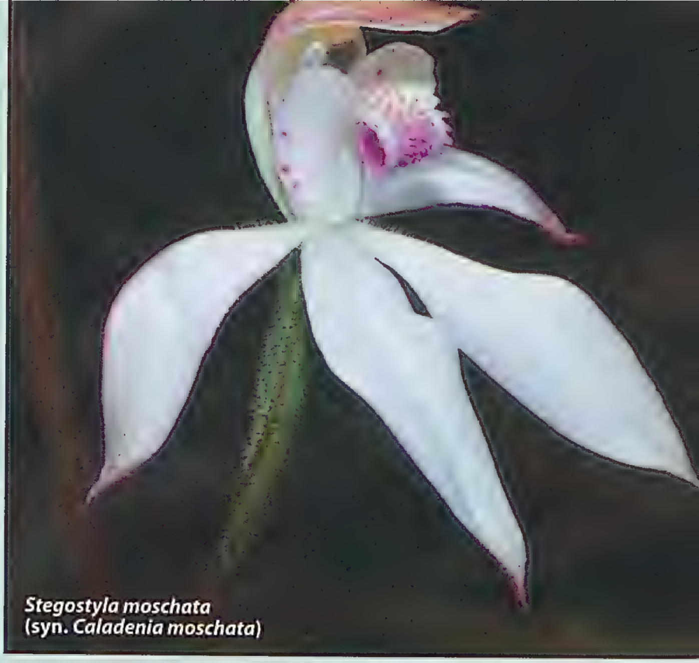


Petalochilus fuscatus (syn. *Caladenia fuscata*)



Stegostyla moschata (syn. *Caladenia moschata*)

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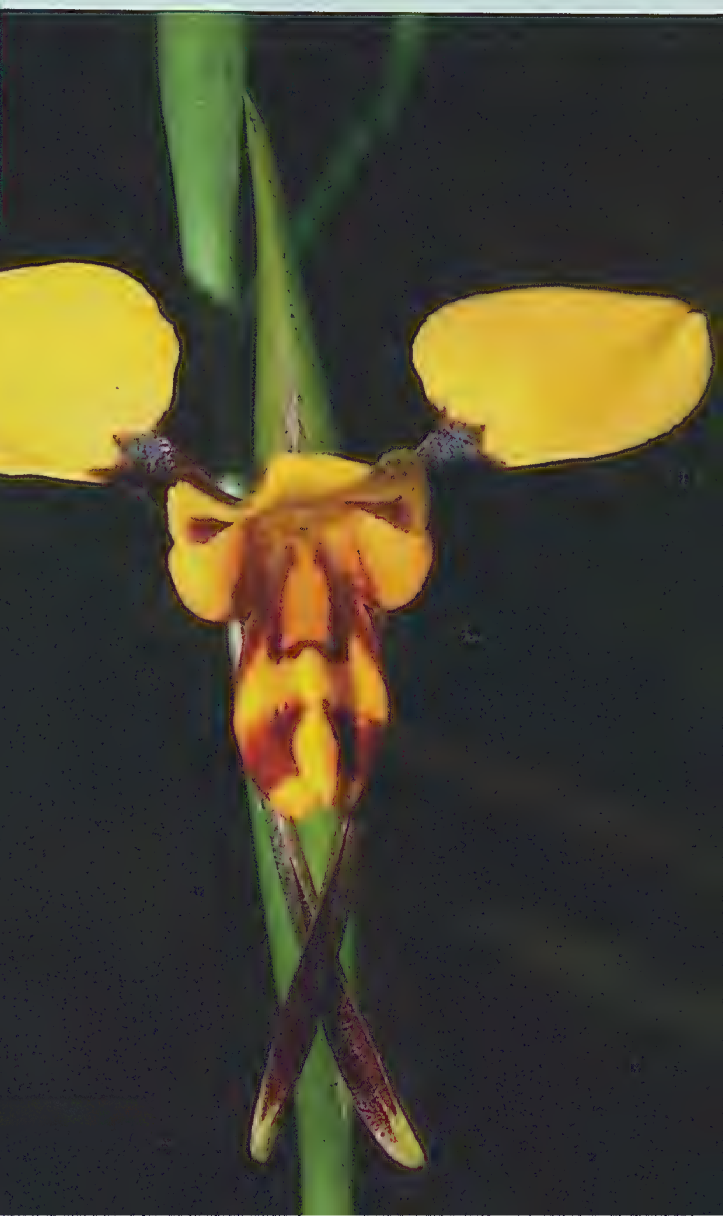


Diuris sulphurea

Two New Species of Orchidaceae from Victoria

by David L. Jones

Abstract

Bunochilus scapulus, Corunastylis capparina are described here as new and compared with allied taxa.

Key Words

Orchidaceae, *Bunochilus scapulus, Corunastylis capparina*, new species, Victoria, Australian flora.

Introduction

Continuing studies into some genera of terrestrial orchids in south-eastern Australia have revealed undescribed taxa, two of which are described as new in this paper.

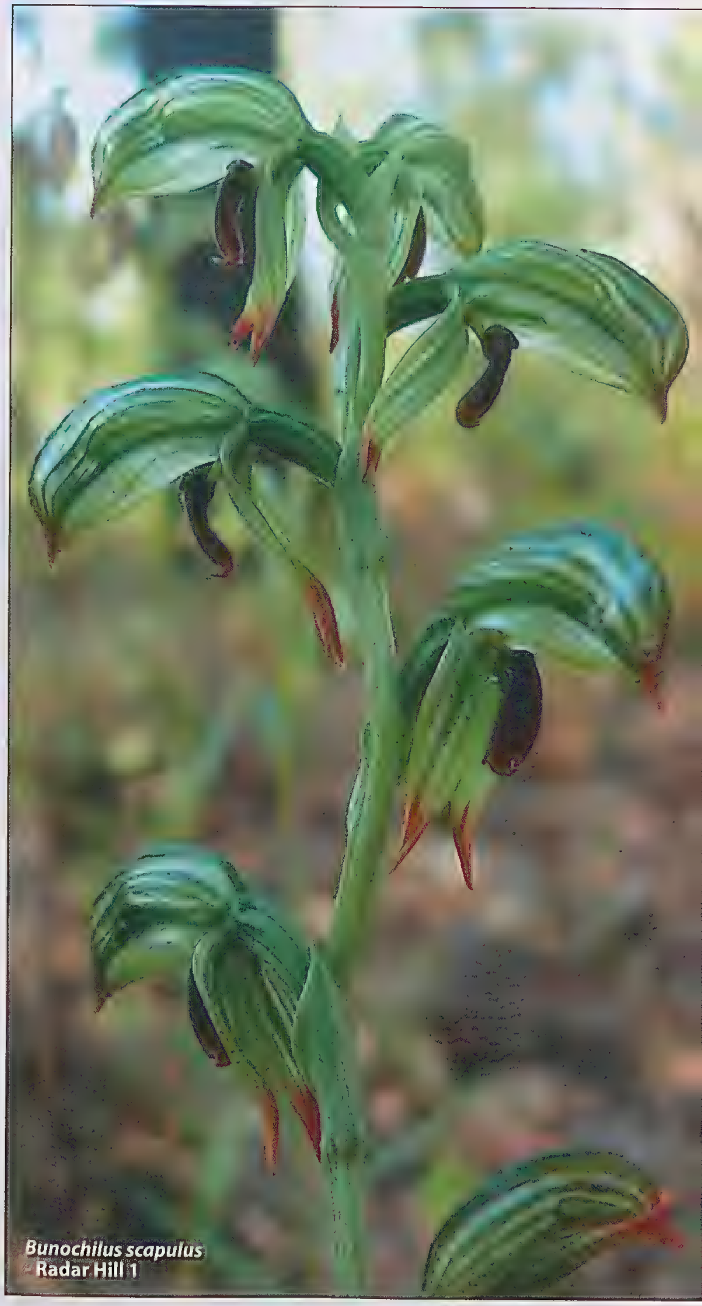
Taxonomy

1. *Bunochilus scapulus* D.L.Jones, ***sp. nov.*** With affinity to *Bunochilus chlorogrammus* (D.L.Jones) D.L.Jones & M.A.Clem. but differing by its larger, broader flowers, an oblong-elliptic synsepalum and a larger reddish brown to dark brown labellum (emerald green in *Bunochilus chlorogrammus*) with large thick incurved lateral lobes that become very pronounced when the labellum is flattened.

Type: Victoria. East Gippsland; c. 1.75 km along Reformatory Rd from Bruthen-Nowa Nowa road, c. 15 km NW of Nowa Nowa, 16 August 2016, *D.L.Jones 16393, B.E.Jones, J. Turner & J.A.Jeanes* (holo CANB, iso MEL).

Illustrations: Page 178, Turner, Bould & Wilkinson (2014), as *Pterostylis chlorogramma.*

Description: *Rosette* stalk 25-55 mm long; leaves 3-6, ovate to ovate-lanceolate or lanceolate, 10-50 mm long, 3-7 mm wide, margins entire or slightly crinkled; petioles 0-8 mm long. *Flowering plants* 30-75 cm tall; stem leaves 4-7, linear-lanceolate to lanceolate, 20-70 mm long, 5-8 mm wide. *Flowers* 1-12, porrect to slightly nodding, 19-23 mm long, 7-8 mm wide, translucent green with prominent darker green stripes, shiny to glossy; sepal tips orange-brown. *Dorsal sepal* 18-20 mm long when flattened, shallowly curved in profile. *Synsepalum* oblong-elliptic, 14-16 mm long, 7-8 mm wide, flat or shallowly convex, margins curved, apex notched (3-4 mm deep); tips parallel or divergent, 6-8 mm apart. *Petals* obliquely oblong, 16-18 mm long, 3.5-4 mm wide, narrow at base (c. 1.5 mm wide); anterior margin shallowly curved; basal flanges large, blunt. *Labellum* held above the lateral sepals and fully exposed when set, reddish brown to dark brown, basal mound and central band darker than the rest, thick in profile with a prominent raised basal mound and incurved apex. *Labellum lamina* oblong to oblong-obovate when flattened, 7.5-9 mm long, 3.5-4 mm wide, surface cells rounded and bead-like, a cluster of short acicular cells present towards the base on either side of the basal mound; basal mound erect, blunt; lateral lobes large, thick, incurved; midlobe c. 2 mm long, narrowly notched, the lobes acute to acuminate, apex incurved. *Column* 15-18 mm long, curved; wings c. 4 mm long, c. 2.5 mm wide, with a blunt apical lobe 0.6-0.7 mm long. *Anther* c. 1.4 mm long, erostrate. *Pollinia* oblong, c. 2 mm long. *Stigma* oblong-elliptic, c. 7 mm long, c. 2 mm wide. *Capsules* not seen.



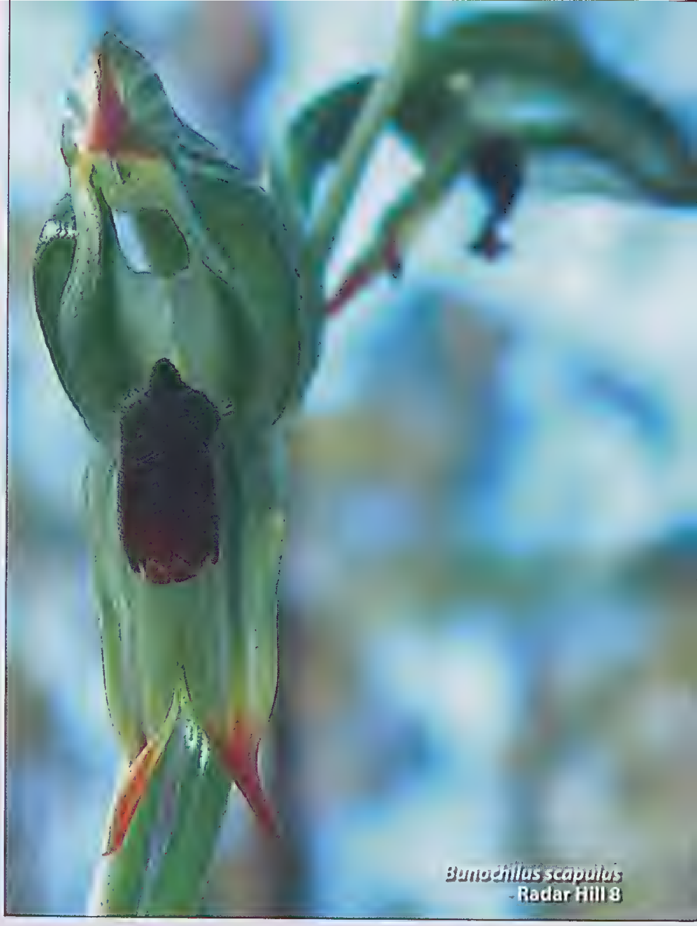
Bunochilus scapulus
Radar Hill 1

Distribution and ecology: Occurs in East Gippsland, Victoria, mainly in forests to the north-west of Nowa Nowa but also recorded from near Genoa, north of Orbost and south of Cann River (Turner *et al.* 2014). Alt. 20–80 m. It grows in open forest with a relatively dense shrubby understorey in shallow clay loam. Flowering: July to September.

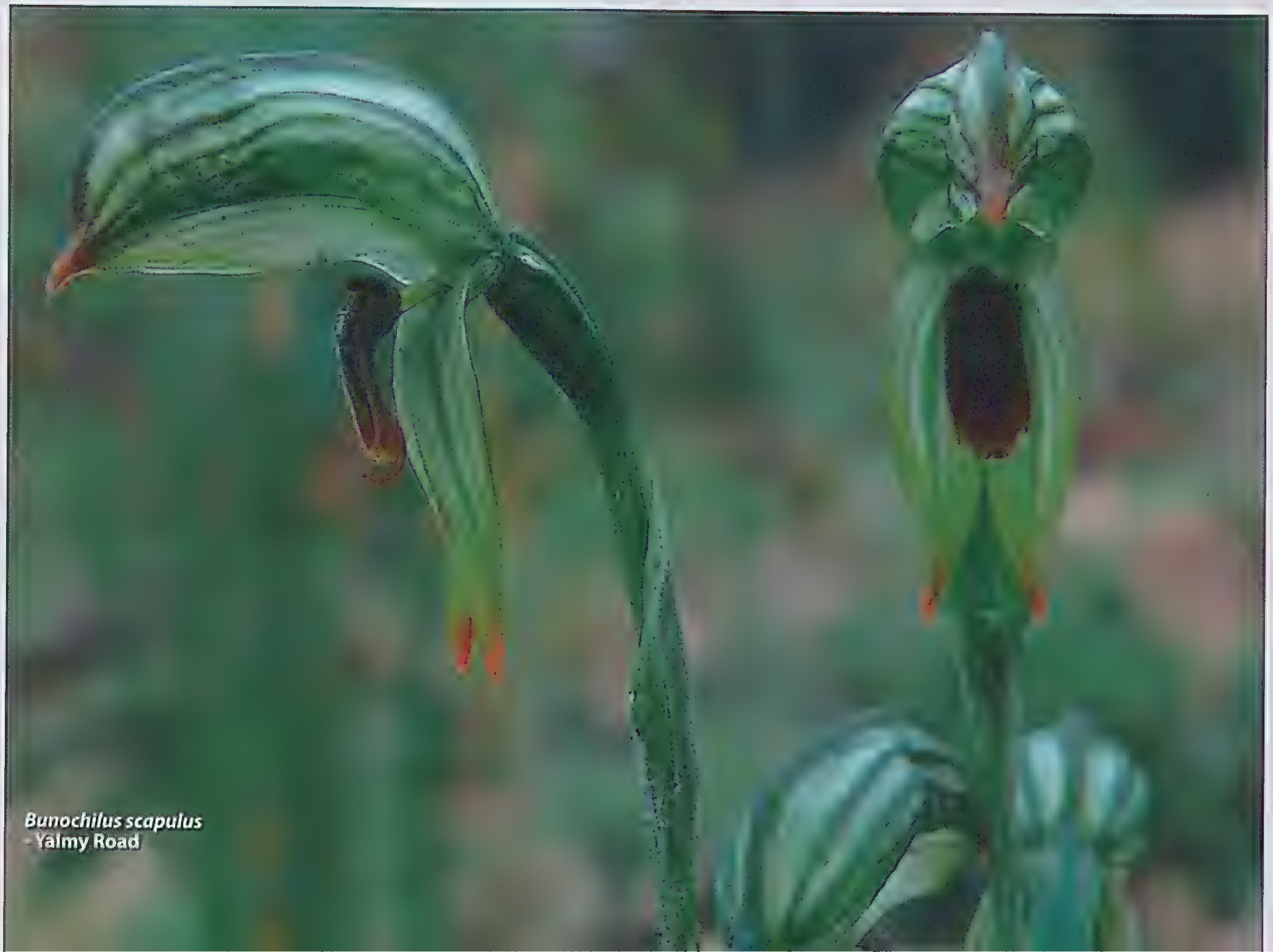
Recognition: Characterised by robust habit, relatively large glossy flowers (19–23 x 7–8 mm) which are pale translucent green with prominent darker stripes in the galea, petals with large basal flanges that block off the basal part of the galea, oblong-elliptic synsepalum, large (7.5–9 x 3.5–4 mm) reddish brown to dark brown, oblong to oblong-obovate labellum, most of the surface covered with beaded siliceous cells, a few long acicular hair-like cells towards the base. It is noticeable that the large labellum hangs conspicuously clear of the synsepalum.

Similar species: This species is somewhat similar to *Bunochilus chlorogrammus* but has larger, broader flowers, an oblong-elliptic synsepalum, and a larger reddish brown to dark brown labellum (emerald green in *Bunochilus chlorogrammus*) with large thick incurved lateral lobes that become very pronounced when the labellum is flattened. *Bunochilus tunstallii* is the only other species growing in the area with a brown labellum but it has much smaller flowers, lacks blocking petal flanges in the galea and has a relatively small tapered labellum.

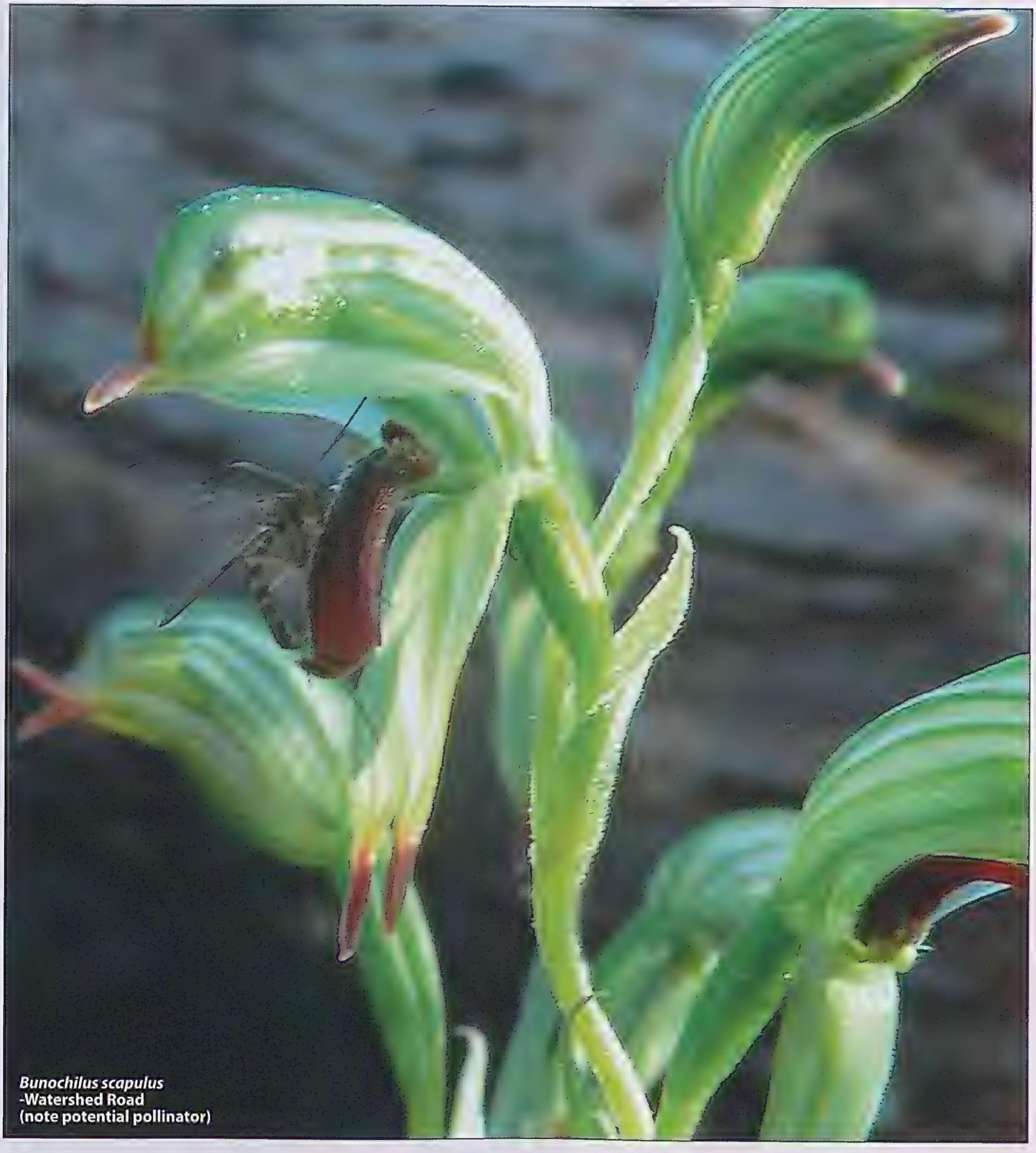
Notes: This species, which was apparently first recognised as distinct by Bill Kosky, is scattered in small populations. Strong robust plants occur in burnt habitats the season following a summer bushfire (J.Turner pers. comm.).



Bunochilus scapulus
- Radar Hill 8



Bunochilus scapulus
- Yalmy Road



Bunochilus scapulus
-Watershed Road
(note potential pollinator)

Conservation status: Fairly widespread but generally uncommon to rare and threatened by logging operations and road works (the population south of Cann River has been severely impacted, perhaps destroyed, by road widening); a small population is conserved in Croajingalong National Park; suggest 3VC by the criteria of Briggs & Leigh (1996).

Etymology: From the Lating *scapulus*, scapula, shoulder blade, in reference to the large lateral lobes on the labellum which impart the impression of shoulders in the flattened labellum.

Other specimens: VICTORIA: East Gippsland; c. 7.2 km along Reformatory Rd from Bruthen-Nowa Nowa road, c. 18 km NW of Nowa Nowa, 16 August 2016, *D.L.Jones 16394, B.E.Jones, James Turner & Jeff Jeanes* (CANB).

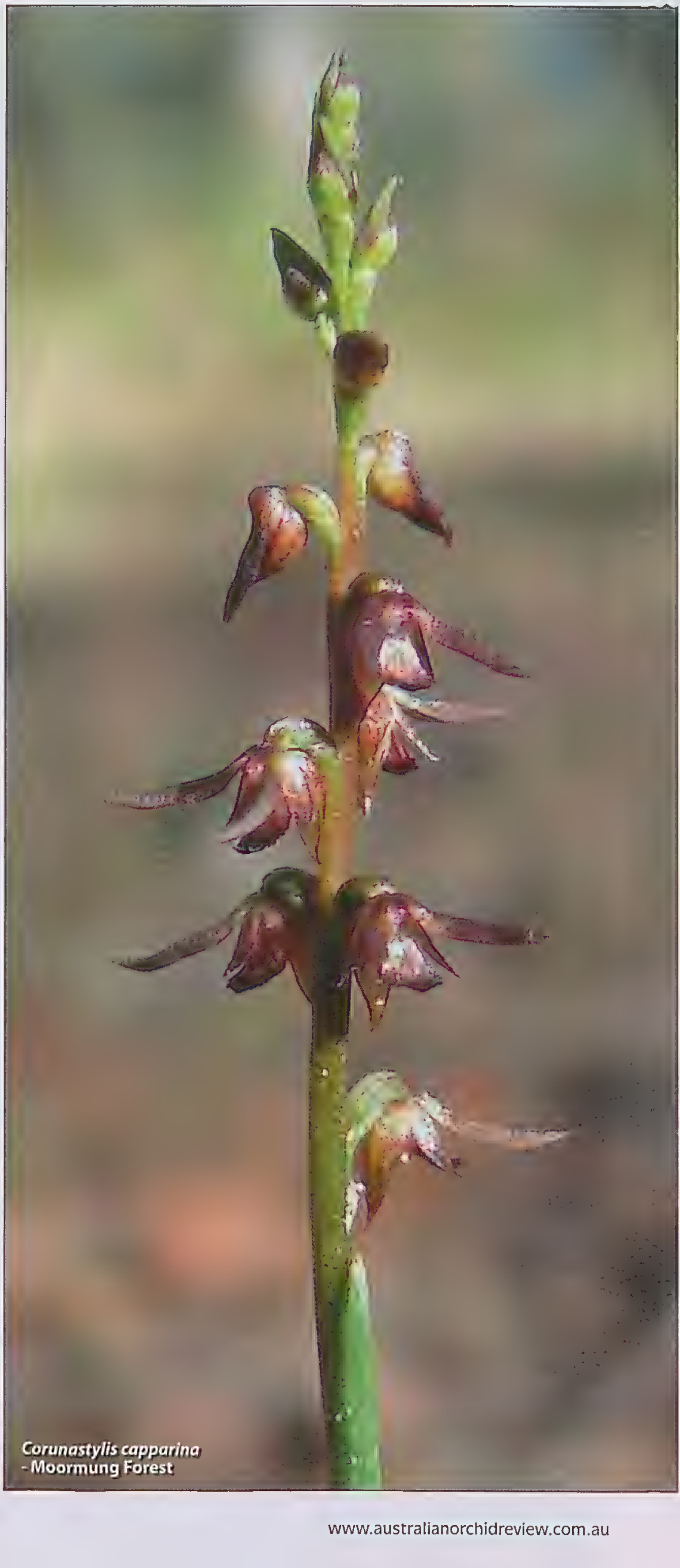
2. *Corunastylis capparina* D.L.Jones, *sp. nov.* With affinity to *Corunastylis rufa* (R.Br.) D.L.Jones & M.A.Clem. but differing by its green flowers suffused with dark purple-brown (pinkish-red to bright red in *Corunastylis rufa*), obovate-cuneate labellum with irregularly thickened margins (not thickened in *Corunastylis rufa*), green and purple-black labellum callus (reddish-black at the base, apex whitish to bright red in *Corunastylis rufa*) and shortly acuminate, minutely denticulate anterior lobe on the column wings (long-acuminate-filiform and glabrous in *Corunastylis rufa*).

Type: Victoria. East Gippsland; Blond Bay Wildlife Reserve, beside Banksia Track, *J.A.Jeanes 3111 & J.Turner* (holo CANB, iso MEL).

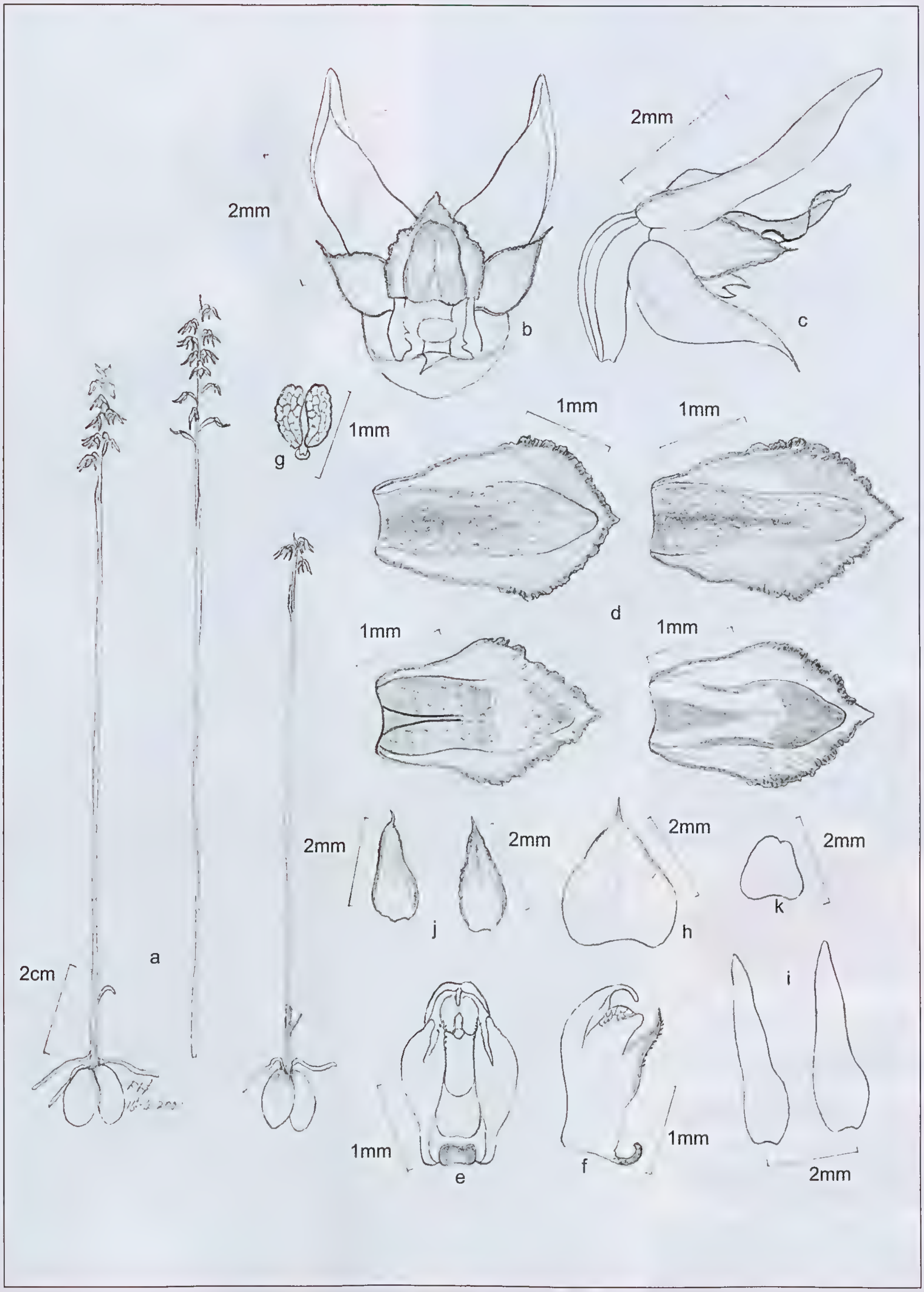
Illustrations: Page 81, Page 178, Turner, Bould & Wilkinson (2014).

Description: Terrestrial tuberous herb. *Leaf* slender, terete, 15-20 cm long, c. 1.3 mm wide, dull green, reddish towards the base; lamina subulate, 8-15 mm long, c. 2.3 mm wide, closely sheathing the scape at the base, distal half obliquely erect, ending 1-15 mm below the first flower. *Inflorescence* 15-25 cm tall, bearing 2-20 flowers in a moderately crowded spike 1-3 cm long. *Flowers* deflexed, 3.5-4 mm across, green suffused with dark purple-brown, often greenish towards the tips of the sepals. *Fertile bracts* closely sheathing, ovate, c. 1.8 mm long, c. 1.4 mm wide, green with dark margins, apex subacute. *Ovary* linear-obovate, c. 2.5 mm long, curved, smooth. *Dorsal sepal* cucullate, broadly ovate, 3-3.5 mm long, c. 2.5 mm wide, greenish with dark margins and a dark central line, acuminate. *Lateral sepals* obliquely decurved, asymmetrically linear-lanceolate, 4-4.5 mm long, 1-1.3 mm wide, shallowly gibbous at the base, divergent, distally involute, without a terminal gland. *Petals* spreading, narrowly ovate-lanceolate, c. 2.5 mm long, c. 1 mm wide, recurved near the apex, acuminate to apiculate, the margins dark and appearing thickened. *Labellum* attached by a narrow dark basal claw; lamina cuneate in outline when flattened, 2.5-2.9 mm long, 1.5-1.8 mm wide, usually curved, green and purple-black, thick and fleshy, distal margins darker and irregularly thickened, apex acute. *Callus* occupying about half of the ventral surface area of the lamina, extending nearly to the apex, c. 0.8 mm wide at the base, green and blackish, thick, fleshy, weakly colluviate, channelled proximally. *Column* pale with some dark markings, c. 2 mm long, c. 1.7 mm wide; column foot deflexed, c. 0.8 mm long, c. 0.45 mm wide, curved forwards near the apex. *Column wings* lobed one third to halfway to the base, the lobes hardly divergent; posterior lobe oblong, tapered, obtuse, entire; anterior lobe narrowly lanceolate, apex acuminate, minutely denticulate. *Anther* ovate, c. 1 mm long, c. 0.8 mm wide, with a filiform rostrum c. 0.4 mm long. *Stigma* nearly round, c. 0.7 mm long, c. 0.4 mm wide, sunken. *Pollinarium* c. 0.9 mm long; pollinia c. 0.7 mm long, yellow, coarsely granular; caudicle ligulate, c. 0.2 mm long; viscidium c. 0.12 mm across. *Capsules* obovoid, c. 6 mm long, c. 2mm across, green, sometimes with darker ribs. **Fig. 1.**

Distribution and ecology: Apparently confined to East Gippsland, Victoria, where occurring in a few localities to the west of Bairnsdale. It forms small colonies in coastal heathland in sandy soil and heathy-forests in clay loam in near-coastal and adjacent areas further inland. This species may well occur in south-eastern New South Wales where similar habitats exist but to date no material has been found. Flowering occurs in March-April.



***Corunastylis capparina* - Moormung Forest**



***Corunastylis capparina*, Moormung, Vic, *D.Rouse 10.* (Fig. 1.)**
a. flowering plants; b. flower from front; c. flower from side; d. four labella from above, flattened; e. column from front; f. column from side; g. pollinarium; h. dorsal sepal; i. lateral sepals; j. petals; k. anther cap.
Drawing © **David L.Jones 16 April 2001**

Recognition: This species, which has for many decades, been linked with *Corunastylis rufa*, is readily distinguished from that species by its green flowers suffused with dark purple-brown, obovate-cuneate labellum with irregularly thickened margins, green and purple-black labellum callus and shortly acuminate, minutely denticulate anterior lobe on the column wings. By contrast *Corunastylis rufa*, which is from the Central Coast of New South Wales, has pinkish-red to bright red flowers, an obovate labellum without thickened margins, labellum callus that is reddish-black at the base and whitish to bright red at the apex and glabrous column wings with the anterior lobe long-acuminate-filiform. The new species also has affinities with *Corunastylis clivicola* D.L.Jones, from hilly terrain in northern Victoria, southern NSW and the ACT, which can be distinguished by its broadly elliptic dorsal sepal, longer, thinner lateral sepals, and narrower labellum with a strongly colluviate labellum callus.

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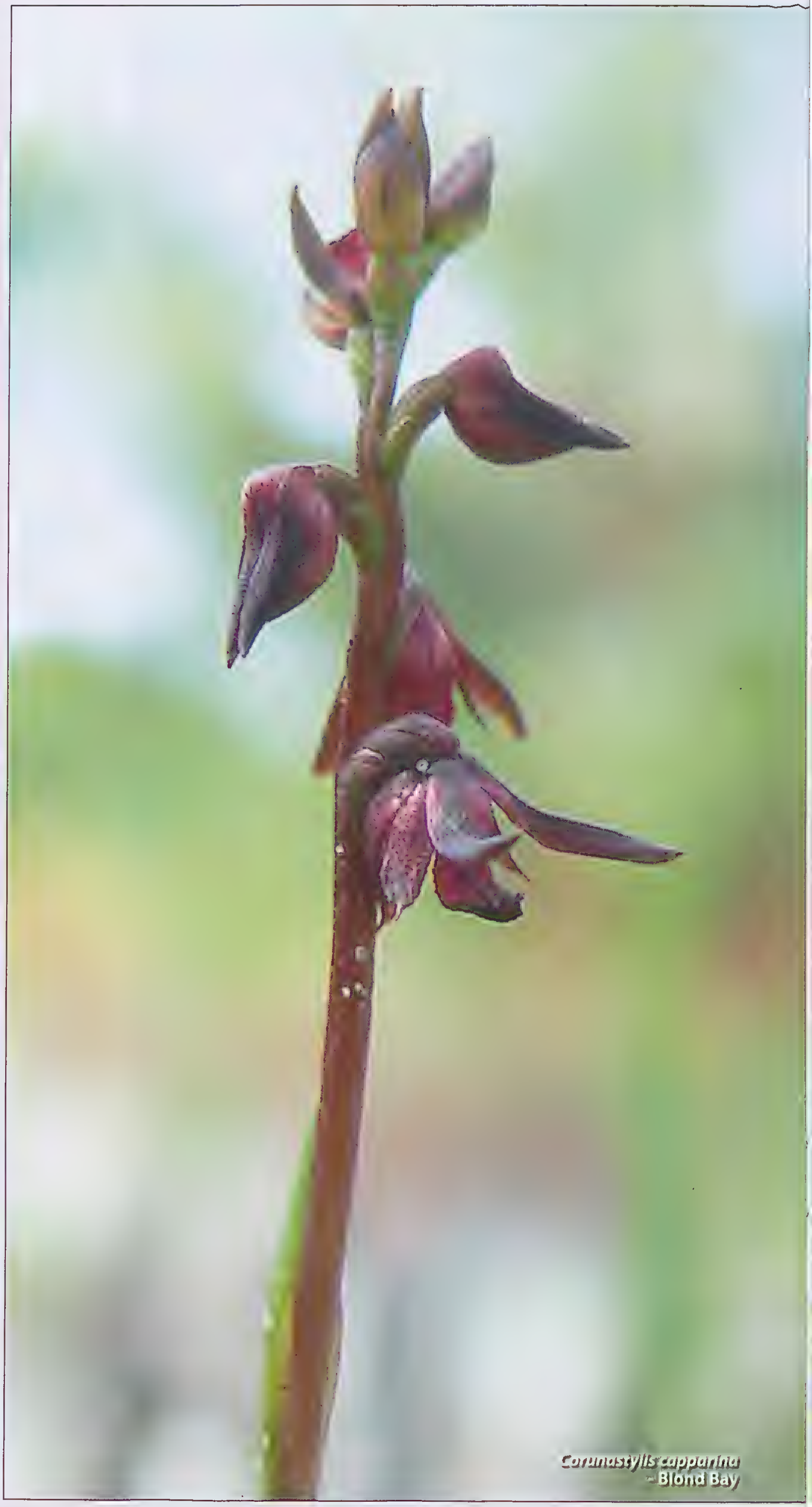

Corunastylis capparina
- Blond Bay

Etymology: The Latin *capparinus*, a vague colour term meaning greenish-brown, referring to the colours prominent in the flowers of the new species. This epithet has been chosen to distance this orchid from *Corunastylis rufa* with which it has been long confused but in fact shares few similarities, especially flower colour.

Other collections: Moormung, 15 April 2001, *Dean Rouse 10* (CANB).

Acknowledgements

Much appreciation to James Turner and Jeff Jeanes for providing access to populations of *Bunochilus scapulus* and *Corunastylis capparina* in the field and information about distribution and conservation of the species, James Turner for the photos used in this paper, Dean Rouse for specimens of *Corunastylis* and discussions about Victorian orchids, Gary Backhouse for bringing *Bunochilus scapulus* to my attention and my wife Barbara for support and companionship in the field.

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- Jeanes, J. & Backhouse, G. (2006). *Wild Orchids of Victoria*, Aquatic Photographics, Seaford, Australia.
- Turner, J, Bould, A. & Wilkinson, J. (2014). *Orchids of East Gippsland, A Field Guide*, Bairnsdale & District Field Naturalists Club Inc. ■

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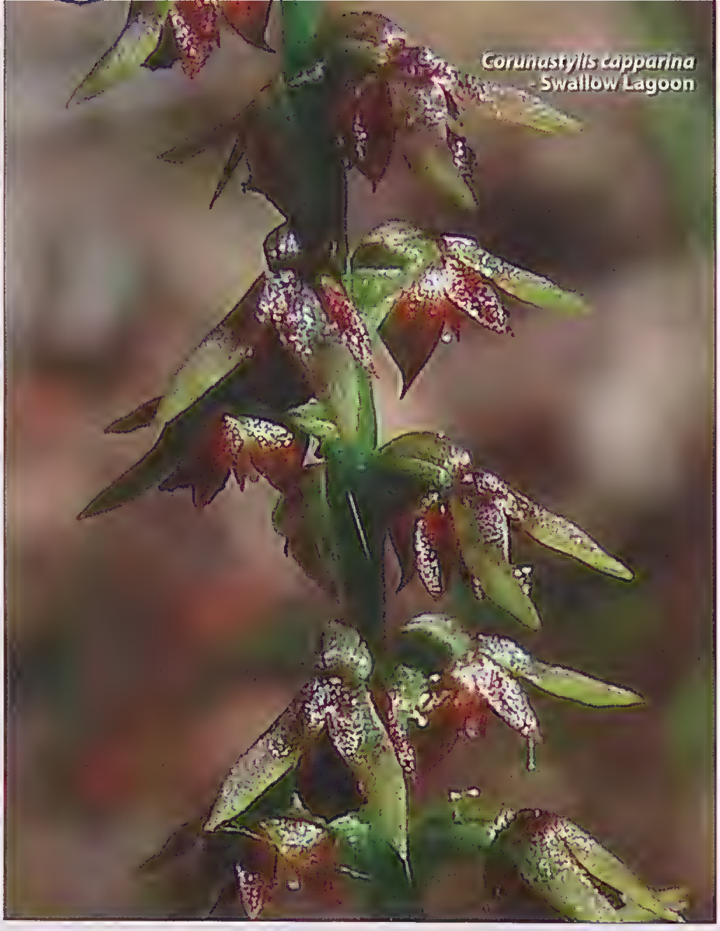

Corunastylis capparina - Swallow Lagoon

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Three New Species of *Speculantha* (Orchidaceae: Pterostylidinae) from eastern Australia

by David L. Jones

Abstract

Speculantha borealis, *Speculantha corpulenta* and *Speculantha vescula*, new species with affinities to *Speculantha parviflora*, *Speculantha antennifera* and *Speculantha rubescens*, are described from eastern Australia. *Speculantha corpulenta* is widely distributed but localised and well conserved, *Speculantha borealis* is scattered in small populations, however *Speculantha vescula* is known from just a single site.

Key Words

Orchidaceae, *Speculantha borealis*, *Speculantha corpulenta*, *Speculantha vescula*, *Speculantha parviflora*, *Speculantha antennifera*, *Speculantha rubescens*, new species, conserved, Australian flora, Queensland, New South Wales, Victoria, South Australia.

Introduction

The morphological characters of *Speculantha* as a segregate genus from *Pterostylis* were defined by Jones & Clements (2002) and reiterated in a later paper (Jones & Copeland 2014). *Speculantha* consists of 17 currently described species distributed along the east coast of Australia, including Tasmania and south-eastern parts of South Australia. Seven new species of *Speculantha* have been described in recent papers (Jones & Copeland 2014, Jones 2015, Jones & Copeland 2016) and a further three species from eastern Australia are here described as new.

Taxonomy

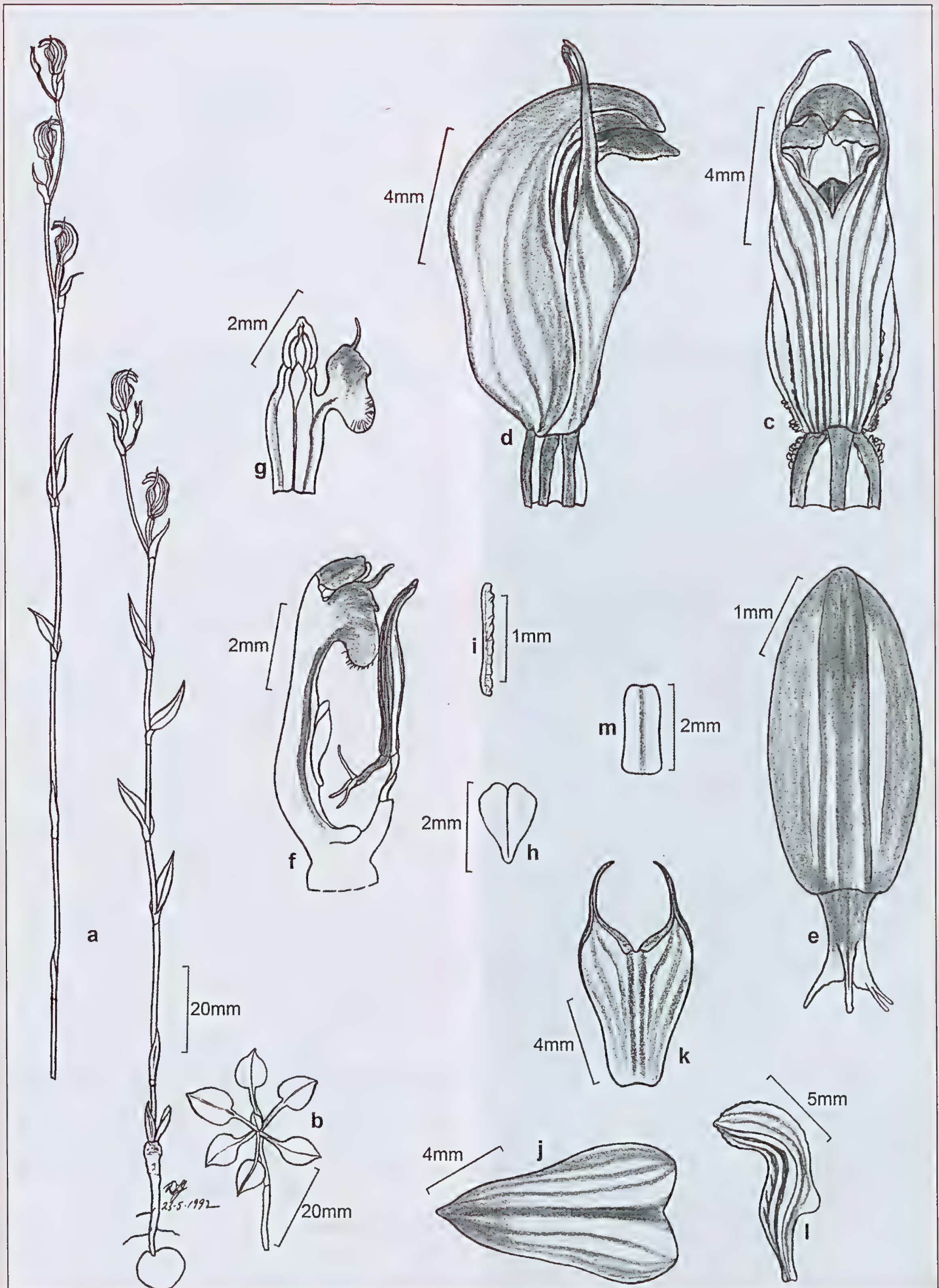
1. *Speculantha borealis* D.L.Jones, ***sp. nov.*** With affinity to *Speculantha parviflora* (R.Br.) D.L.Jones & M.A.Clem., but differing by its larger paler coloured flowers and long inrolled filiform free points that extend high above the galea; also affinity with *Speculantha antennifera* D.L.Jones but differing by fewer and smaller rosette leaves, larger spreading foliose stem leaves and a broadly elliptical labellum with a much thicker basal appendage (narrowly elliptical with a thin basal appendage in *S. antennifera*).

Type: Queensland. Cook District: St Patricks Hill, Herberton, April 1991, *L.Lawler 88* (holo CANB 891139; iso BRI).

Description: Glabrous, tuberous, terrestrial *herb*. *Plants* 7-25 cm tall, not elongating in fruit. *Rosettes* usually absent at anthesis, a single one appearing after anthesis, borne on a lateral growth from the base of the scape. *Rosette leaves* spreading, 3-7 per rosette; lamina ovate, 3-10 mm long, 3-7 mm wide, dull bluish green; margins entire; apex subacute to apiculate; petioles 2-10 mm long, slender, narrowly winged. *Scape* very slender, wiry, 1-5-flowered. *Sterile bracts* spreading, foliose, 3-5, ovate-lanceolate, 3-15 mm long, 3-4.5 mm wide, acuminate. *Fertile bracts* spreading, ovate to ovate-lanceolate, 3-8 mm long, 2-3 mm wide, acuminate. *Pedicels* 1-3 mm long, slender. *Ovaries* narrowly obovoid, 2-4 mm long, smooth or slightly verrucose. *Flowers* well spaced, 1-3 open at once, externally smooth, 8-10 mm long, 3.5-4 mm wide, green and white striped at the base, flushed with light brown towards the apex of the galea (sometimes wholly pale green and white); galea inflated at the base, stiffly erect before curving forwards in a semi-circle; dorsal sepal shorter than the petals, smooth (non-scabrous). *Dorsal sepal* ovate-lanceolate when flattened, 10-12 mm long, 5-6 mm wide, inflated at the base then tapered to apex, striped, acute to apiculate, smooth. *Lateral sepals* erect, closely embracing the galea; side view flat, bulging near the top and curved gently inwards; sinus frontal opening deeply vee-notched, 2-2.5 mm wide; conjoined part 5-7 mm long, 4-5 mm wide, narrowed to 1.6 mm wide at the base; free points erect, c. 3 mm long, margins inrolled with long-acuminate or filiform points, extending well above the top of the galea. *Petals* oblong, 8-10 mm long, 2-2.5 mm wide, strongly falcate, light brown with white stripes, acute; flange c. 1 mm across, broadly deltate, entire. *Labellum* erect, the tip visible through the sinus in the set position, slightly curved forwards near the apex, light brown and white. *Labellum lamina* broadly elliptical, 3.2-3.7 mm long, 1.5-1.8 mm wide, obtuse; basal appendage decurved, c. 1.3 mm long, broadest at the base (0.6 mm wide); apex trifid, erect. *Callus* a raised, central, pale brown ridge c. 0.5 mm across. *Column* 5-6.5 mm long, curved away from the ovary at 50° at the base then erect, brown. *Column wings* c. 2 mm long; basal lobe ovate-deltate, c. 0.8 mm long, c. 0.8 mm wide, reddish, at an angle of 80°; apex broadly obtuse; inner margins adorned sparsely with short, white cilia; mid-section c. 1 mm long, brown; apical lobe obliquely erect or curved, filiform, c. 0.7 mm long, acute. *Anther* c. 1.2 mm long, obtuse. *Pollinia* narrowly linear, c. 1.3 mm long, yellow, mealy. *Stigma* situated basally, scutiform, c. 1.7 mm long, c. 1.3 mm wide, raised. *Capsules* erect, narrowly ellipsoid, 7-9 mm long, 3-4 mm wide, smooth, on pedicels to 5 mm long. **Fig. 1.**

Distribution and ecology: Apparently restricted to the Atherton Tableland and Evelyn Tableland in north-eastern Queensland. It grows in shallow stony soil and clay loam on rocky ridges and sheltered slopes in sparse open forest with a shrubby understorey; also in tall heathy shrubland on rock outcrops and in accumulations of gravelly soil on granite boulders. Alt. 700-1300 m. Flowering: March to May.

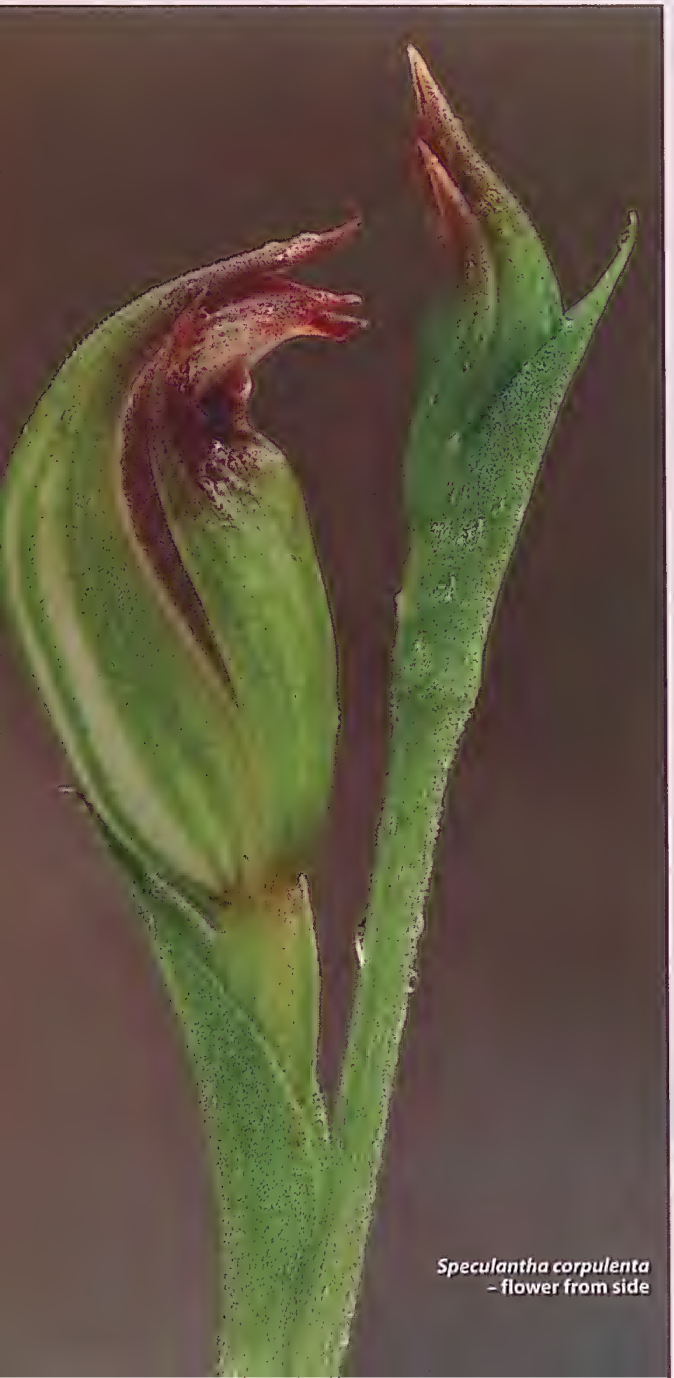
Recognition: Characterised by autumn-winter flowering period; rosettes appearing late in anthesis or after anthesis; bluish green rosette leaves (to 10 x 7 mm); short to tall, wiry scape; large spreading foliose stem leaves; 1-5-flowered inflorescence; well-spaced plump flowers, 8-10 x 3.5-4 mm, green and white striped at the base, flushed with light brown towards the apex (sometimes wholly pale green and white); smooth (non-scabrous) dorsal sepal; side view of sinus flat, bulging near the top and curved gently inwards; sinus frontal opening deeply vee-notched, 2-2.5 mm wide; free points inrolled, filiform or long-acuminate, reaching well above the top of the galea; and, a pale brown and white, broadly elliptical labellum, 3.2-3.5 x 1.5-1.8 mm, the tip visible above the sinus opening in the set position.



***Speculantha borealis*, Ravenshoe, Queensland, (LL143)** **(Fig. 1.)**
a. flowering plants; b. rosette; c. flower from front; d. flower from side; e. labellum; f. column and labellum from side; g. top of column from front; h. stigma; i. pollinium; j. dorsal sepal; k. synsepalum; l. petal; m. labellum hinge. **© D.L.Jones 23 May 1992**

Similar species: This species has obvious affinities with *S. antennifera* by virtue of its pale flowers, filiform free points on the sepals which extend above the top of the galea and the labellum apex being visible from the outside in the set position. *Speculantha antennifera* however, can be distinguished by its larger rosettes with more numerous and larger leaves, closely sheathing rather than spreading foliose sterile bracts, and a narrowly elliptical dark red-brown and white labellum with a slender basal appendage.

Notes: Dockrill (1969) records a species of *Speculantha* (as *Pterostylis parviflora*) from the Seaview and Paluma Ranges north of Townsville. I have not seen material from these localities and cannot identify the taxon involved.



Speculantha corpulenta – flower from side

Conservation status: Poorly known, possibly of restricted distribution and not conserved; suggest 2VK by the criteria of Briggs & Leigh (1996).

Etymology: The Latin *borealis*, northern, in reference to its occurrence as the most northerly species in the genus.

Other specimens: QUEENSLAND: SFR 488, 2.5 km S of Ravenshoe, off Wooroora Road, 8 May 2001, *A.Graham & B.Hewett (AF 2816)* (BRI, CANB); SFR 185, Platypus L.A., 30 Mar. 1986, *B.Gray 4304* (CANB, QRS); SFR 194, Western-Wallum Trig, 7 Apr. 1986, *B.Gray 4305* (QRS); Ravenshoe Cemetery, 1 June 1990, *L.Lawler 89* (CANB); St Patricks Hill, Herberton, 13 Apr. 1991, *L.Lawler 143* (CANB).

2. *Speculantha corpulenta* D.L.Jones, *sp. nov.* With affinity to *Speculantha parviflora* (R.Br.) D.L.Jones & M.A.Clem., but differing by its more robust habit, much larger pale green leaves, much larger plump flowers, scabrous dorsal sepal and broadly elliptical labellum not visible from outside the flower; also with *Speculantha rubescens* D.L.Jones but with smaller paler rosette leaves, fewer, smaller less-scabrous paler flowers and an elliptical labellum that curves forwards at the apex.

Type: South Australia. South-east district: Lake Edward, 14 Apr. 1987, *R.Bates 9902* (holo CBG 9211480; iso AD).

Illustrations: Plates 178, 179, Bates & Weber (1990), as *Pterostylis* sp. aff. *parviflora*, Bates (2008-2014).

Description: Glabrous, tuberous, terrestrial *herb*. *Plants* 6-30 cm tall, not elongating in fruit. *Rosettes* usually absent at anthesis, developing as flowering finishes, 1-2, borne on lateral growths from the base of the scape or on sterile plants. *Rosette leaves* spreading, 3-6 per rosette; lamina ovate, 3-7 mm long, 3-6 mm wide, light green; margins entire; apex acute to apiculate; petioles 3-8 mm long, slender, narrowly winged. *Scape* slender, wiry, 1-7-flowered. *Sterile bracts* closely sheathing or spreading at the tips, 3-5, ovate-deltate, 5-12 mm long, 3-5 mm wide, acuminate. *Fertile bracts* closely sheathing, oblong to ovate-oblong, 3-7 mm long, 2-4 mm wide, acuminate. *Flowers* moderately crowded, 1-3 open at once, 9-11 mm long, 4-5 mm wide, base green and white, apical parts red brown, with a strong floral scent of semen; galea inflated at base, erect before curving forwards in a semi-circle; dorsal sepal shorter than the petals, the distal parts of each scabrous. *Dorsal sepal* broadly ovate-lanceolate when flattened, 12-15 mm long, 6-8 mm wide, inflated at the base then tapered to apex, boldly striped, acute to apiculate, distally scabrous. *Lateral sepals* erect, closely embracing the galea; sinus stepped strongly inwards, the area below bulging prominently when viewed from the side, flat with a shallow medial notch when viewed from the front, margins flat; conjoined part 6-7 mm long, 5-6.5 mm wide, narrowed to 2 mm wide at the base; free points erect or curved forwards, 2-2.5 mm long, tapered, acuminate, not reaching the top of the galea. *Petals* broadly oblong, 10-11 mm long, 2.5-3 mm wide, strongly falcate, dark brown striped with white, darker on the ventral side, obtuse to apiculate; flange poorly developed, c. 1 mm across, obtuse. *Labellum* erect, not visible through sinus in any position, slightly curved forwards near apex, bright red-brown and white. *Labellum lamina* elliptical, 4-4.5 mm long, 1.5-1.8 mm wide; base tapered inwards; apex obtuse; basal appendage decurved, c. 1.5 mm long, broadest at the base; apex trifid, erect. *Callus* a raised, central, dark red ridge c. 0.3 mm across. *Column* 6-8 mm long, curved away from the ovary at 50° at the base then erect, red brown and white. *Column wings* c. 2.2 mm long; basal lobe broadly deltate, c. 1 mm long, c. 0.7 mm wide, brown, at an angle 70°; apex broadly obtuse; inner margins adorned sparsely with short, white cilia; mid-section c. 1 mm long, brown; apical lobe obliquely erect or curved, filiform, c. 1 mm long. *Anther* c. 1.2 mm long, obtuse. *Pollinia* linear-clavate, c. 1.3 mm long, yellow, mealy. *Stigma* situated centrally, cordate to scutiform, c. 2.2 mm long, c. 2 mm wide, raised. *Capsules* erect, ovoid to ellipsoid, 9-12 mm long, 3-5 mm wide, on pedicels to 6 mm long. **Fig. 2.**

Distribution and ecology: Occurs in extreme south-western Victoria and south-eastern South Australia. It commonly grows in lowland areas, mainly near swamps or on swamp margins in damp to relatively moist grey sandy loam; also in light sandy soil under shrubs and grasstrees. The vegetation consists of open forest with a shrubby or heathy understorey and heathland. The plants are often prominent along the edges of tracks or in areas that have been mowed or slashed. Alt. 20-100 m. Flowering: February to June.

Recognition: *Speculantha corpulenta* is a robust member of the genus with large (for the genus), plump flowers. It is characterised by late summer-winter flowering period; rosettes appearing late in anthesis or soon after anthesis; light green rosette leaves (to 6 x 7 mm); tall, wiry scape; sheathing sterile bracts; 1-7-flowered inflorescence; moderately crowded, plump flowers, 9-11 mm long, 4-5 mm wide, base green and white, apical parts red brown; scabrous dorsal sepal and petals; sinus sharply stepped inwards, flat with a medial notch when viewed from the front, the area below bulging when viewed from the side; tapered free points that do not reach the top of the galea; and, a broadly elliptical bright red-brown and white labellum, 4-4.5 x 1.5-1.8 mm, the tip not visible from the exterior in any position.

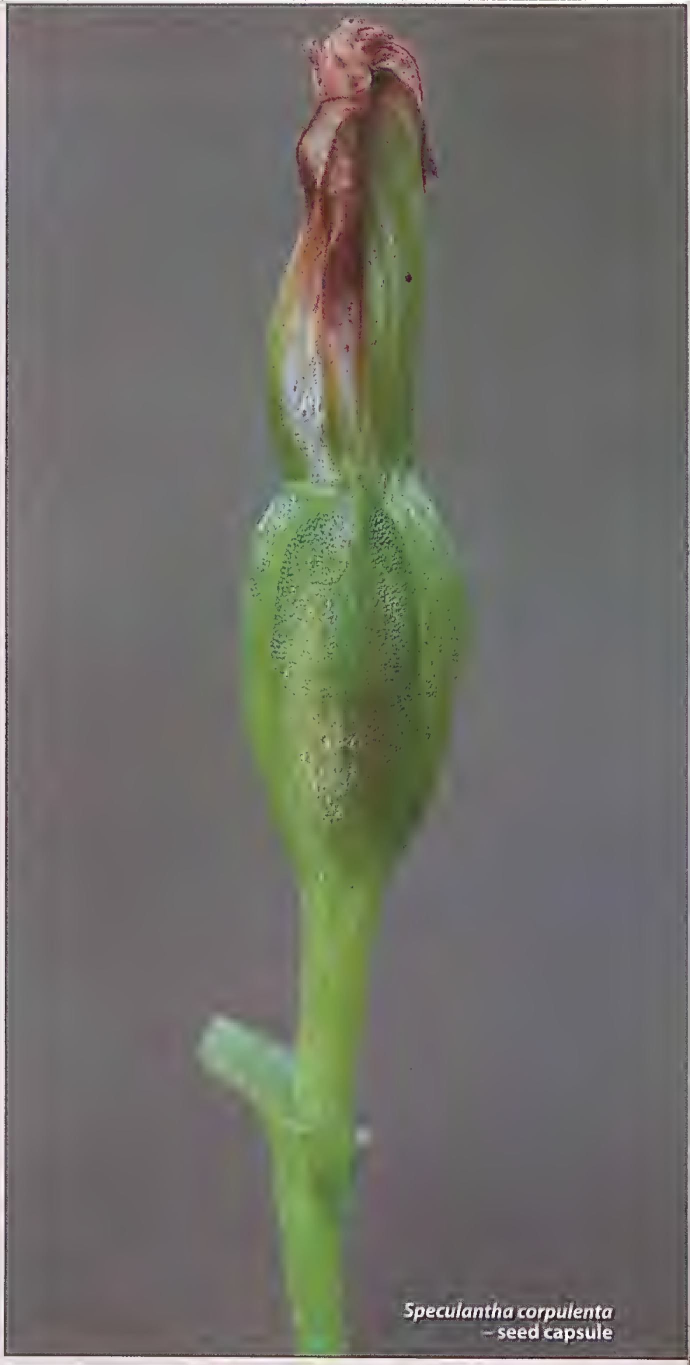
Similar species: *Speculantha rubescens* D.L.Jones has similarities with *S. corpulenta* but has much larger rosette leaves, more numerous, larger strongly scabrous darker brown flowers and an elliptical-rhomboid labellum that curves in at the base.

Notes: The flowers of *S. corpulenta* are insect-pollinated and emit a strong semen-like scent.

Conservation status: Widely distributed, often locally common and well conserved.

Etymology: The Latin *corpulentus*, fat, corpulent, in reference to the very plump flowers.

Other specimens: VICTORIA: Gorae West, May 1944, *A.C.Beauglehole 4860* (MEL); Gorae, 26 Apr. 1932, *M.Holmes* (MEL); Portland, Apr. 1935, *F.Mellblom* (MEL); SOUTH AUSTRALIA: 3 km S of Glencoe, 10 Apr., *R.Bates 1062* (AD); Marshes Swamp, 16 Apr. 1977, *R.Bates 3001* (AD); near Glencoe, 10 Apr. 1985, *R.Bates 5260* (AD); 1 km S of Lake Edward, 26 Apr. 1987, *R.Bates 9852* (AD); Nangkita, 10 Apr. 1966, *D.Hunt* (AD); The Marshes Forest Reserve, 16 May 1998, *D.E.Murfet 3190* (AD, CANB); Honans Scrub Forest Reserve, 17 May 1998, *D.E.Murfet 3195* (CANB); The Marshes Forest Reserve, 31 May 2000, *D.E.Murfet 3747* (CANB); Glencoe, 12 Apr. 1969, *R.Nash* (CANB); 14 miles from Glencoe on road to Compton, 2 May 1970, *R.Nash* (AD, CANB).



Speculantha corpulenta – seed capsule

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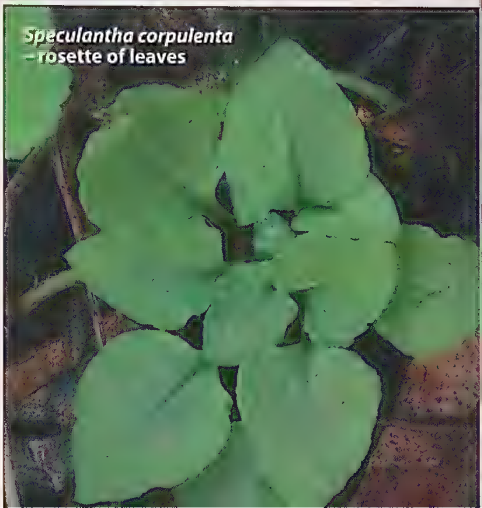
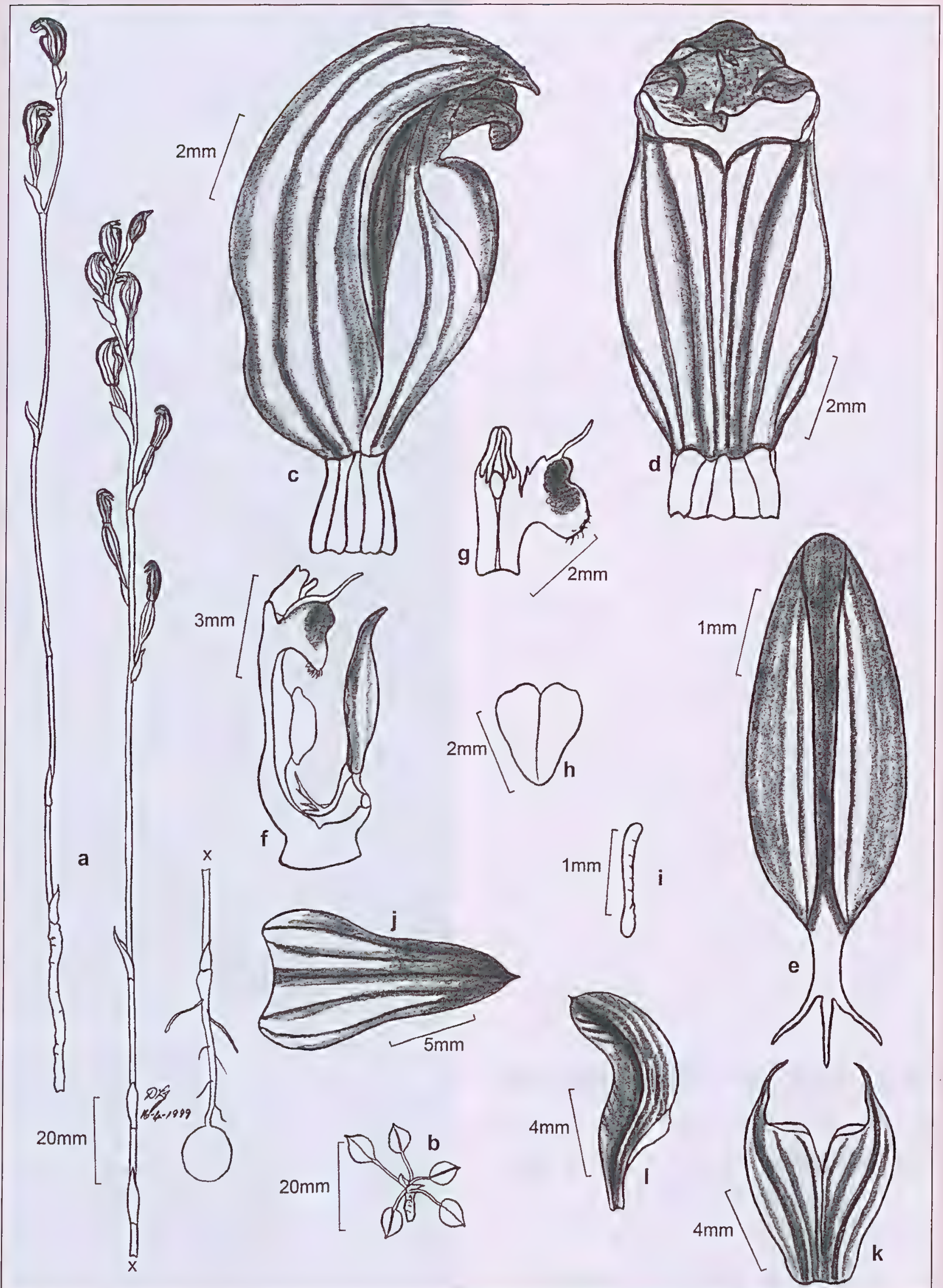


Speculantha corpulenta – rosette of leaves

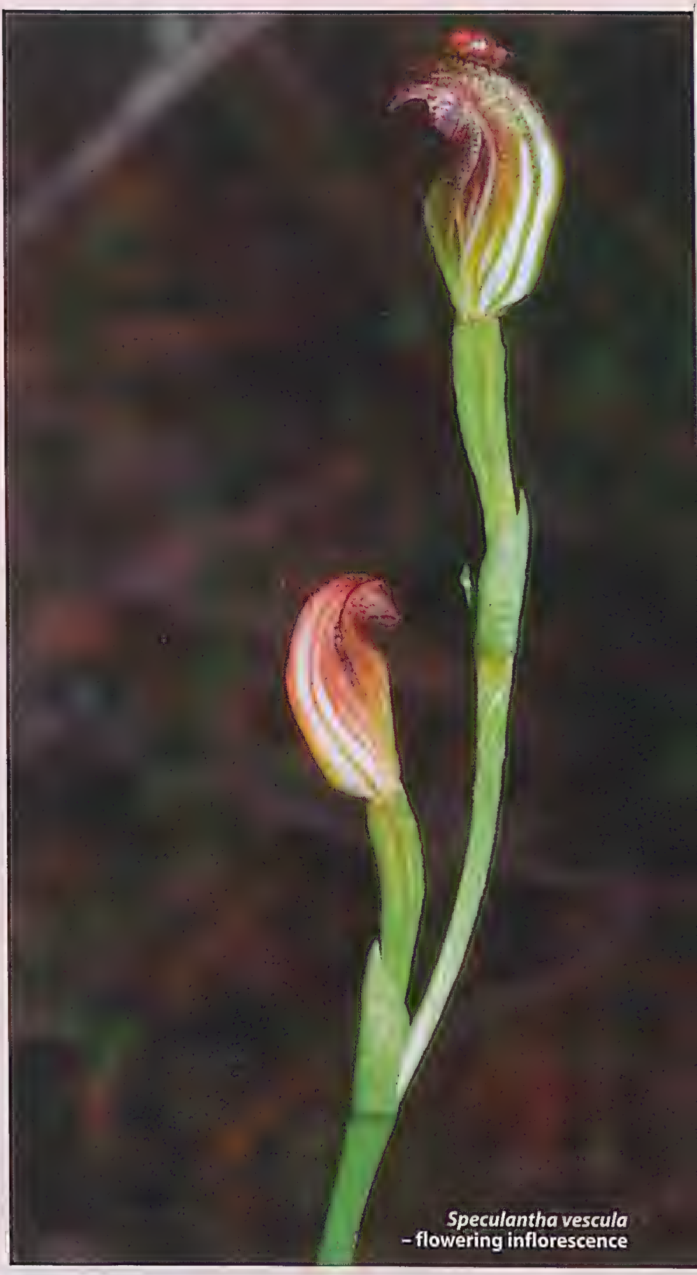


***Speculantha corpulenta*, Marshes Swamp, Honans Scrub, SA** (Fig. 2.)
a. flowering plants; b. flower from side; c. flower from front; d. labellum; e. column and labellum from side; f. top of column from front; g. stigma; h. pollinium; i. dorsal sepal; j. synsepalum; k. petal; l. labellum hinge. © **D.L.Jones 16 April 1999**

3. ***Speculantha vescula*** D.L.Jones, *sp. nov.* With affinity to *Speculantha parviflora* (R.Br.) D.L.Jones & M.A.Clem., but differing by its larger, wider, pale green and brown flowers, scabrous dorsal sepal, lateral sepals and petals (smooth in *S. parviflora*), broadly notched sinus (narrowly notched in *S. parviflora*) and narrowly obovate labellum (oblong in *S. parviflora*) which tapers from above the middle to the base.

Type: New South Wales. Jervis Bay National Park, beside road to Summercloud Bay, 9 May 2000, *D.L.Jones 17195 & K.J.Fitzgerald* (holo CANB 616821).

Description: Glabrous, tuberous, terrestrial *herb*. *Plants* 8-20 cm tall, not elongating in fruit. *Rosettes* absent at anthesis or just developing as flowering progresses, usually 1, borne on lateral growths from the base of the scape or on sterile plants. *Rosette leaves* spreading, 3-6 per rosette; lamina ovate to sagittate, 3-10 mm long, 3-8 mm wide, green; margins entire; apex acute; petioles 3-6 mm long, very slender, narrowly winged. *Scape* very slender, wiry, 1-4-flowered. *Sterile bracts* closely sheathing, 3-5, ovate-lanceolate, 5-10 mm long, 2-3 mm wide, acuminate. *Fertile bracts* sheathing to spreading, ovate, 3-7 mm long, 2-4 mm wide, acuminate. *Pedicels* 1-2 mm long, slender. *Ovaries* obovoid, 3-5 mm long, smooth. *Flowers* moderately crowded, 1-2 open at once, 7-9 mm long, 3-3.5 mm wide, pale green and brown; galea inflated at base, erect before curving forwards in an elongate semi-circle; dorsal sepal and petals of similar length or the petals slightly longer, the distal parts of the dorsal sepal, petals and free points of the synsepalum scabrous. *Dorsal sepal* ovate-lanceolate when flattened, 9-11 mm long, 4-5 mm wide, inflated at the base then tapered to the apex, striped, acute to apiculate, scabrous distally. *Lateral sepals* erect, closely embracing the galea; sinus curved smoothly inwards, the area below bulging when viewed from the side, deeply notched at the centre when viewed from the front, margins sloping obliquely upwards; conjoined part 5-6 mm long, 5-6 mm wide, narrowed to 2 mm wide at the base; free points erect, 2-2.5 mm long, more or less triangular, just reaching the top of the galea, acuminate. *Petals* oblong, 7-8 mm long, c. 2 mm wide, falcate, brown and white, darker on the anterior side, subacute; flange poorly developed, c. 1 mm across, obtuse, margin irregular. *Labellum* erect, the tip visible through sinus in the set position, curved forwards near the apex, pale brown and white. *Labellum lamina* narrowly obovate, 3.5-4 mm long, 1-1.3 mm wide; base narrowed inwards; apex subacute; basal appendage decurved, c. 0.8 mm long, broadest at the base; apex trifid, suberect. *Callus* a raised, central, pale brown ridge c. 0.3 mm across. *Column* 4-5 mm long, curved away from the ovary at 50° at the base then erect, pale brown and white. *Column wings* c. 2 mm long; basal lobe broadly deltate, c. 0.7 mm long, c. 0.6 mm wide, brown, at an angle of 90°; apex broadly obtuse; inner margins adorned sparsely with short, white cilia; mid-section c. 0.6 mm long, brown; apical lobe erect, filiform, c. 0.8 mm long. *Anther* c. 1 mm long, obtuse. *Pollinia* linear, c. 1.2 mm long, yellow, mealy. *Stigma* situated well below the middle, obovate-cordate, c. 1.6 mm long, c. 1 mm wide, prominently raised. *Capsules* erect, obovoid to ellipsoid, 8-10 mm long, 3-4 mm wide, on pedicels to 3 mm long. **Fig. 3.**



***Speculantha vescula* – flowering inflorescence**

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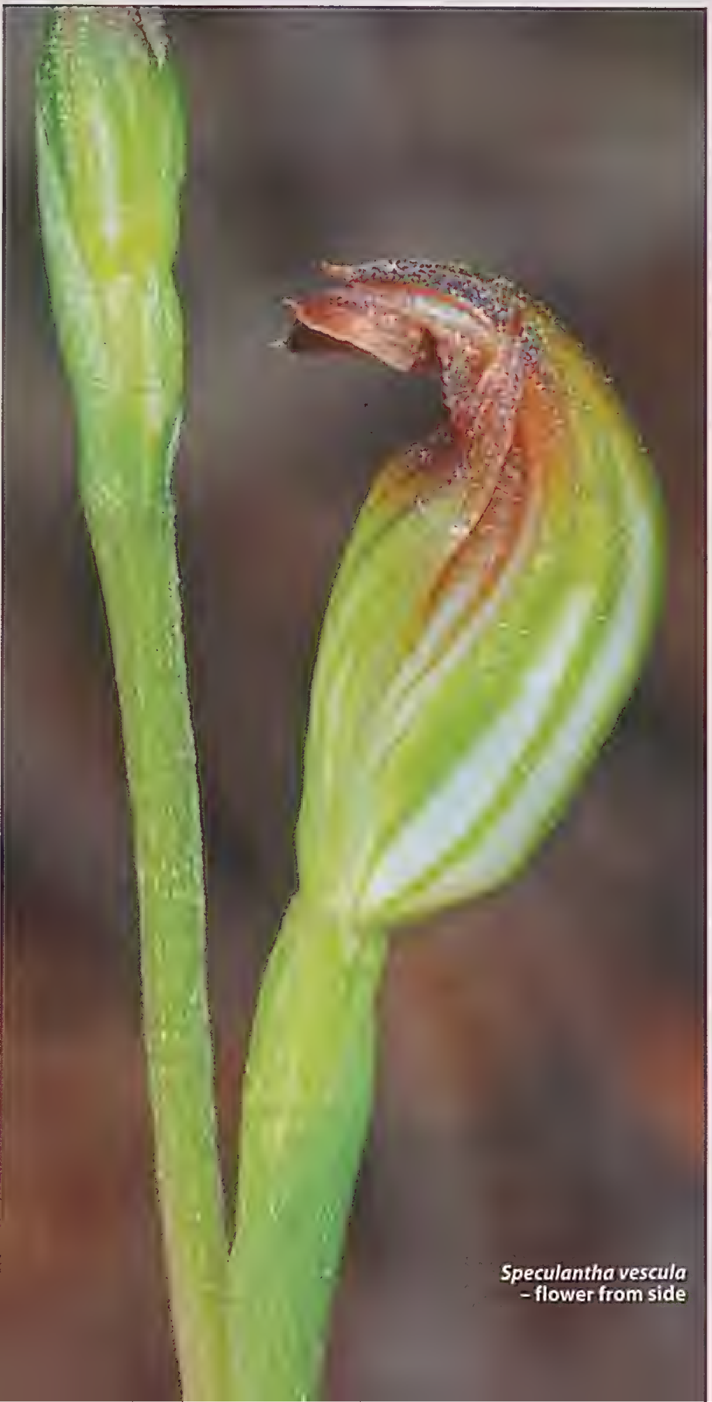
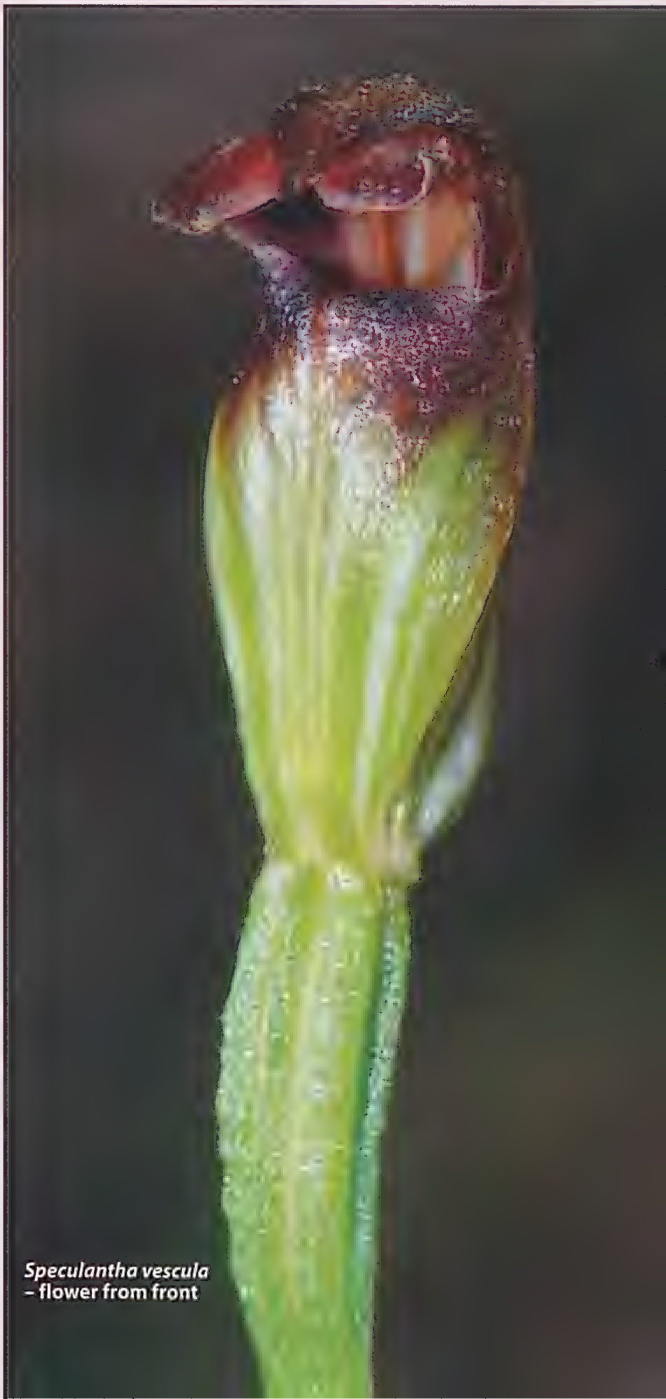
Distribution and ecology: Known only from the vicinity of the type locality in Jervis Bay National Park, but probably more widespread than this. It grows in slashed heath and grassland beside a road. The surrounding vegetation is dense tall heathland which in the natural balance would be burnt regularly, the orchid surviving between fires when the habitat thickens and flowering in the first 2-3 years after a burn (see Notes). The soil is a well-drained grey-black sandy loam. Alt. 10-50 m. Flowering; March to early May.

Recognition: Characterised by late summer-winter flowering period; rosettes appearing late in anthesis or after anthesis; green rosette leaves (to 10 x 8 mm); short wiry scape; sheathing sterile bracts; 1-4-flowered inflorescence; moderately crowded, small, narrow flowers, 7-9 x 3-3.5 mm, pale green and brown; scabrous dorsal sepal, petals and free points; sinus curved inwards, deeply vee-ed when viewed from the front, the area below bulging when viewed from the side; deltate free points just reaching the top of the galea; and, a narrowly obovate, pale brown and white labellum, 3.5-4 x 1-1.3 mm, the tip visible from the exterior in the set position.

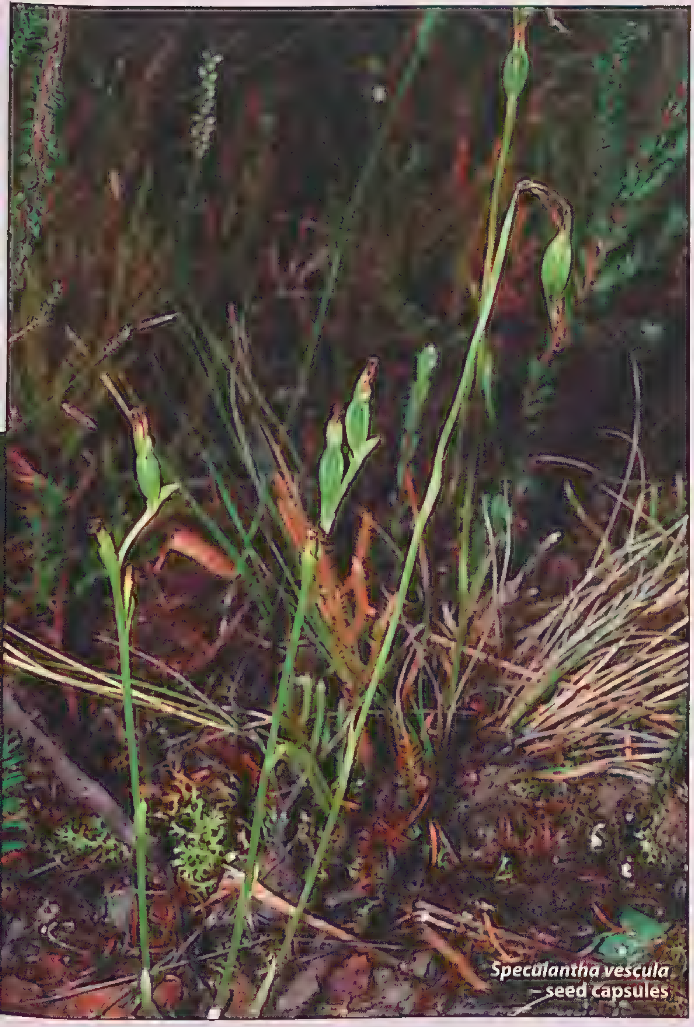
Similar species: A very distinctive small-flowered species with obscure affinities. *Speculantha furva* grows nearby but its flowers are much larger and darker, the sinus is square across the front and the labellum tip is not visible in any position. *Speculantha parviflora* is immediately distinguished by its smaller, narrower, mainly green and white flowers, smooth dorsal sepal, lateral sepals and petals, narrowly notched sinus and oblong labellum with more or less parallel sides. In both *S. parviflora* and *S. vescula* the tip of the labellum is visible through the sinus in the set position.



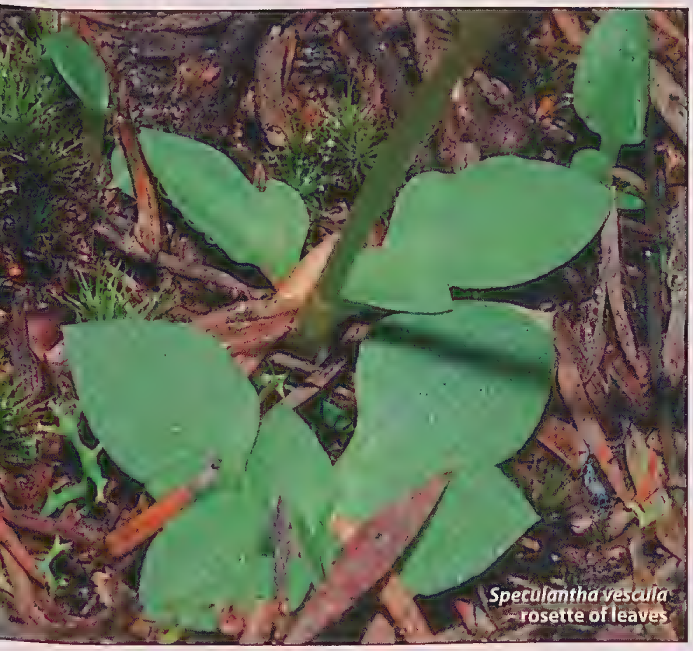
***Speculantha vescula* – flower from side**



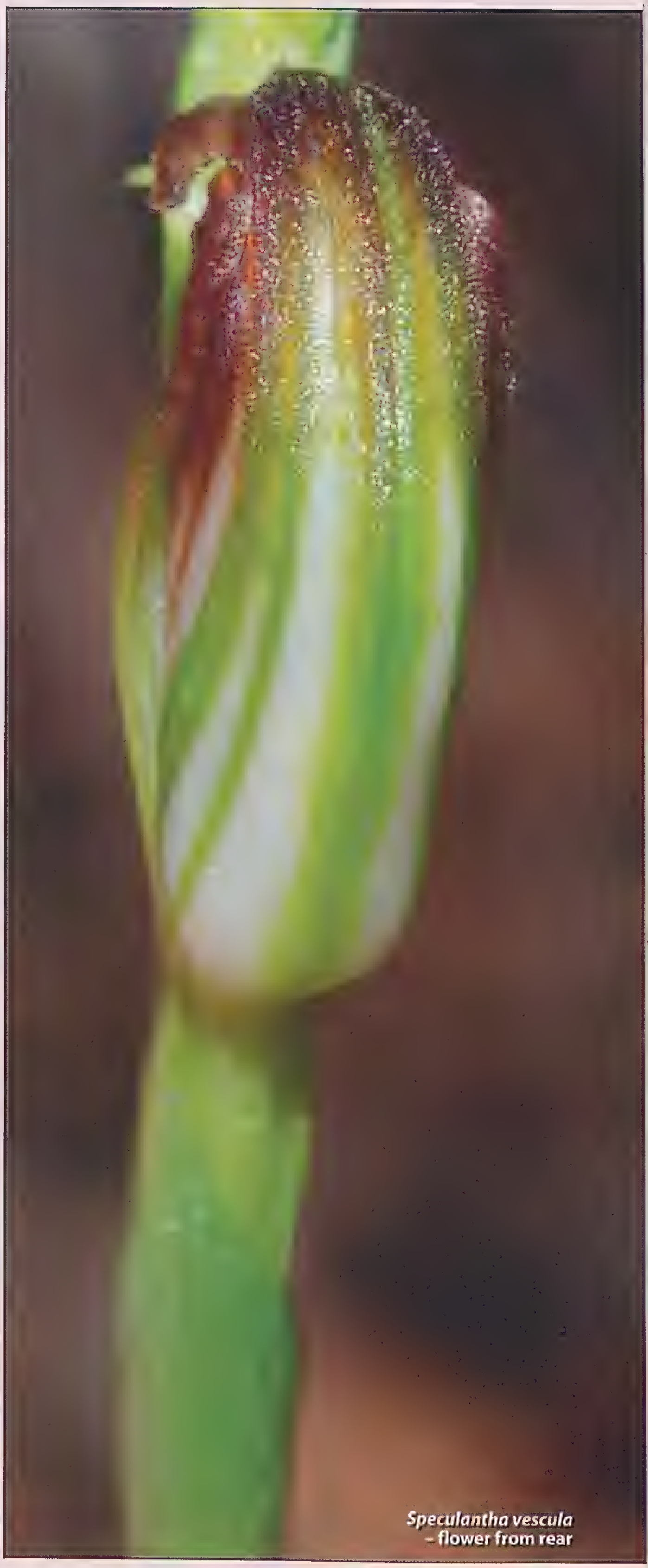
***Speculantha vescula* – flower from front**



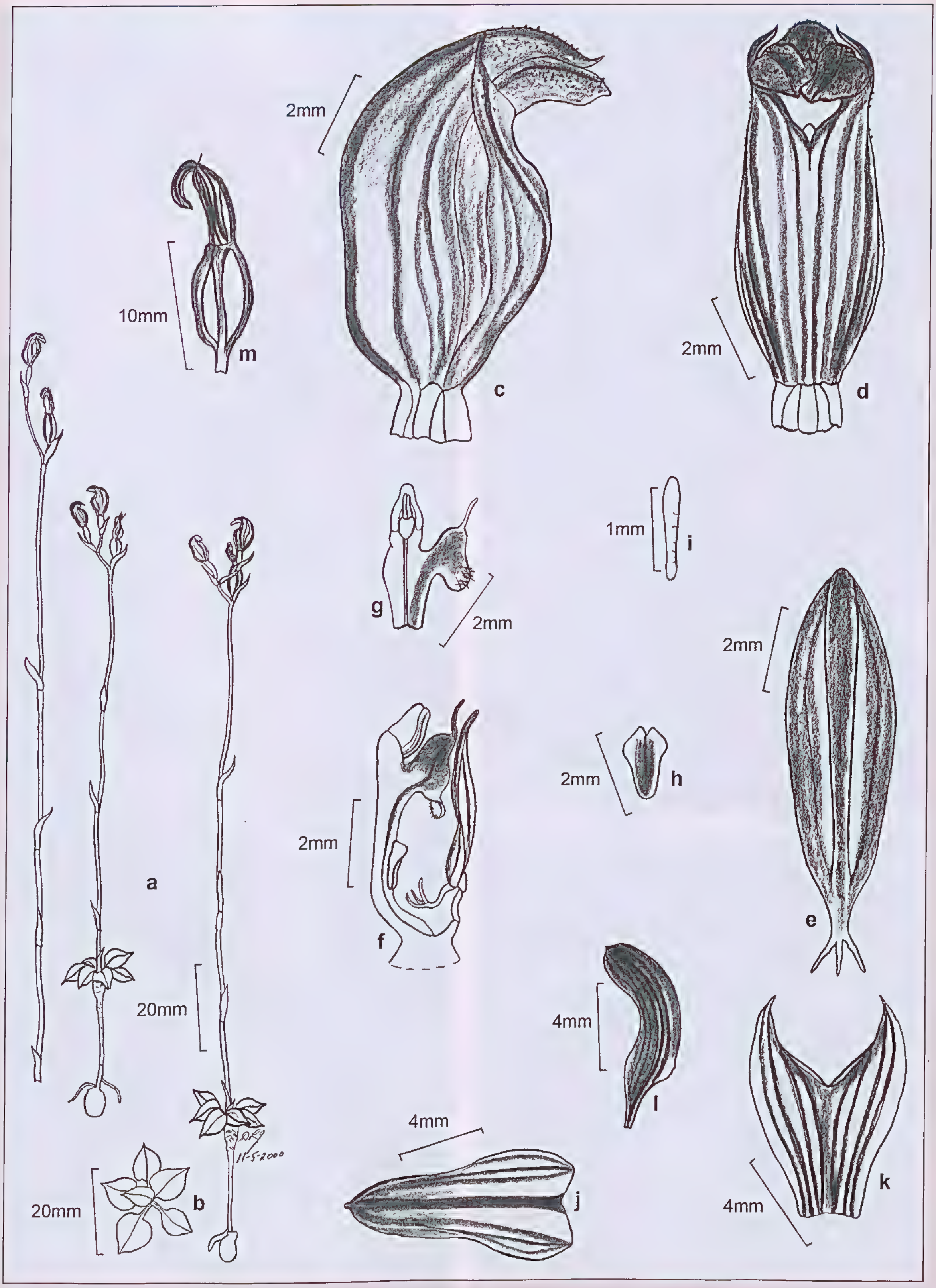
Speculantha vescula
– seed capsules



Speculantha vescula
– rosette of leaves



Speculantha vescula
– flower from rear



Speculantha vescula, **Jervis Bay National Park, NSW (Fig. 3.)**
a. flowering plants; b. rosette; c. flower from side; d. flower from front; e. labellum; f. column and labellum from side; g. top of column from front; h. stigma; i. pollinium; j. dorsal sepal; k. synsepalum; l. petal; m. capsule. © **D.L.Jones 11 May 2000**

Notes: *Speculantha vescula* has taken advantage of the mowing regime that is designed to keep the road verge clear within Jervis Bay National Park. It more than likely occurs in other habitats in the vicinity of Jervis Bay but has probably been disadvantaged by the strictly controlled fire regimes imposed throughout the area.

Conservation status: Highly restricted, poorly known but conserved; suggest 2ECK by the criteria of Briggs & Leigh (1996).

Etymology: The Latin *vesculus*, weak, poor, thin, little, in reference to the short thin scapes and small flowers.

Acknowledgements

I express appreciation to Anna Monro and Emma Toms for help with specimens at CANB; also the directors and curators at AD and CANB for giving access to specimens. Special thanks to Jean Egan for preparing my drawings for publication, Alan Stephenson for monitoring and photographing *Speculantha vescula*, June Niejalke for photos of *Speculantha corpulenta*, the late Len Lawler for help with *Speculantha borealis*, Mark Clements for access to photos of type specimens, Marion Garrett and Karina Richards for technical assistance and Bob Bates for commenting on the manuscript.

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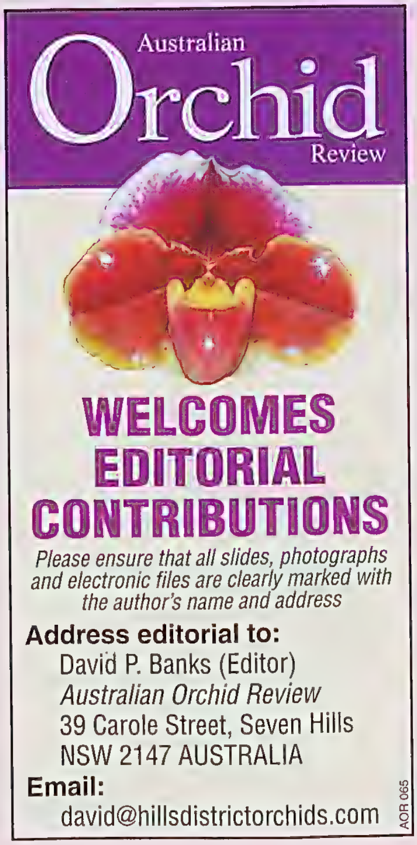
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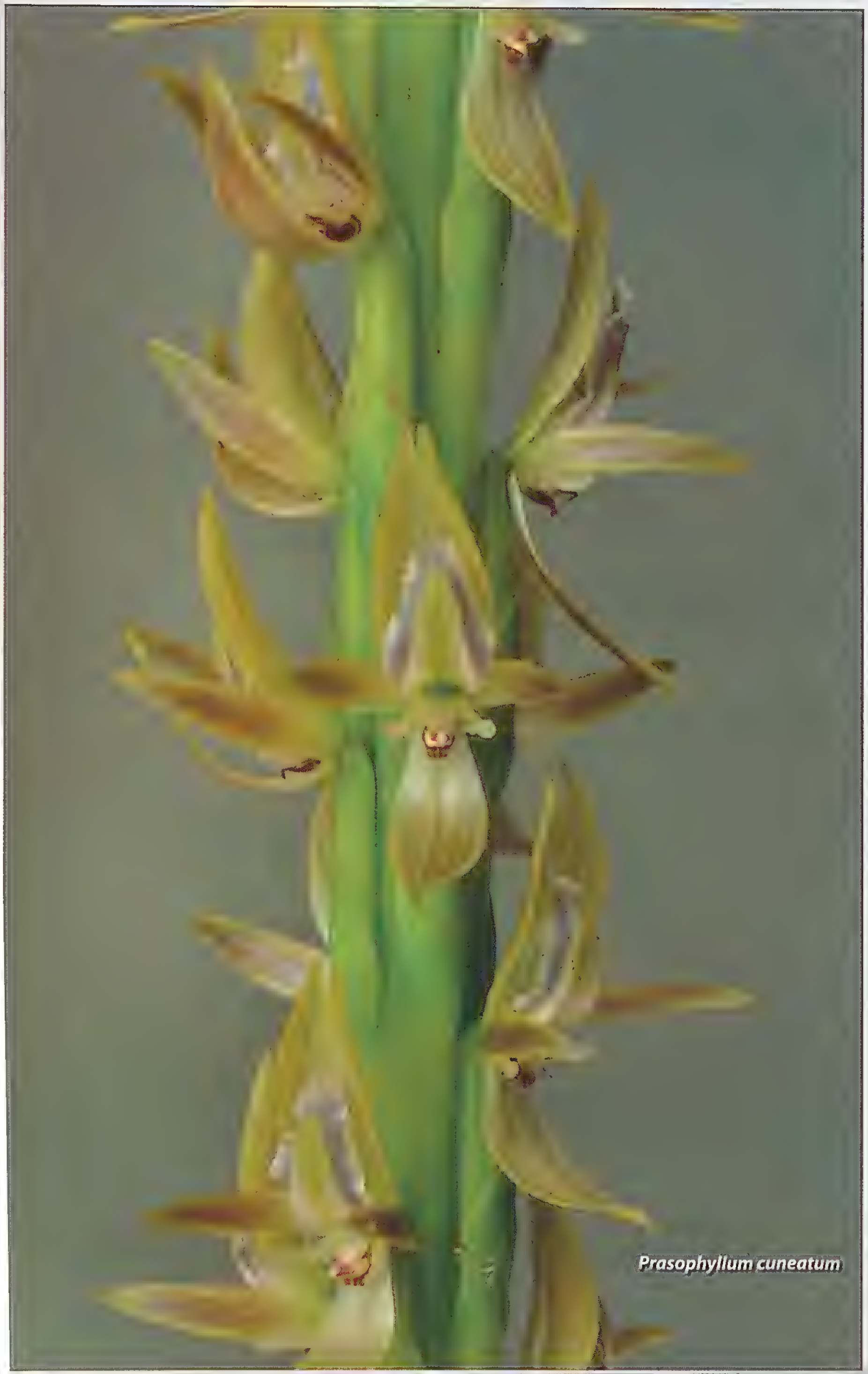
Prasophyllum cuneatum (Orchidaceae), a new species from Western Australia

By David L. Jones and Garry B. Brockman



Prasophyllum cuneatum

Abstract

Prasophyllum cuneatum, a relatively tall growing large-flowered species from Western Australia, is described as new.

Key Words

Orchidaceae, *Prasophyllum cuneatum*, *Prasophyllum regium*, new species, Western Australia, Australian flora.

Introduction

The large-flowered species of *Prasophyllum* in Western Australia are a striking component of regrowth in areas burnt during the previous summer. Most of these orchids require a burn to induce flowering and the results can be spectacular. A new species that was recognised recently as distinct is here described as new.

Taxonomy

1. ***Prasophyllum cuneatum*** D.L.Jones & G. Brockman, ***sp. nov.*** With affinity to *Prasophyllum regium* R.S.Rogers but differing by its shorter habit, fewer, smaller, paler flowers with a shortly stalked labellum and a smaller, thinner callus; also with *Prasophyllum elatum* R.Br. but differing by its flat callus plate which lacks raised ridge-like margins.

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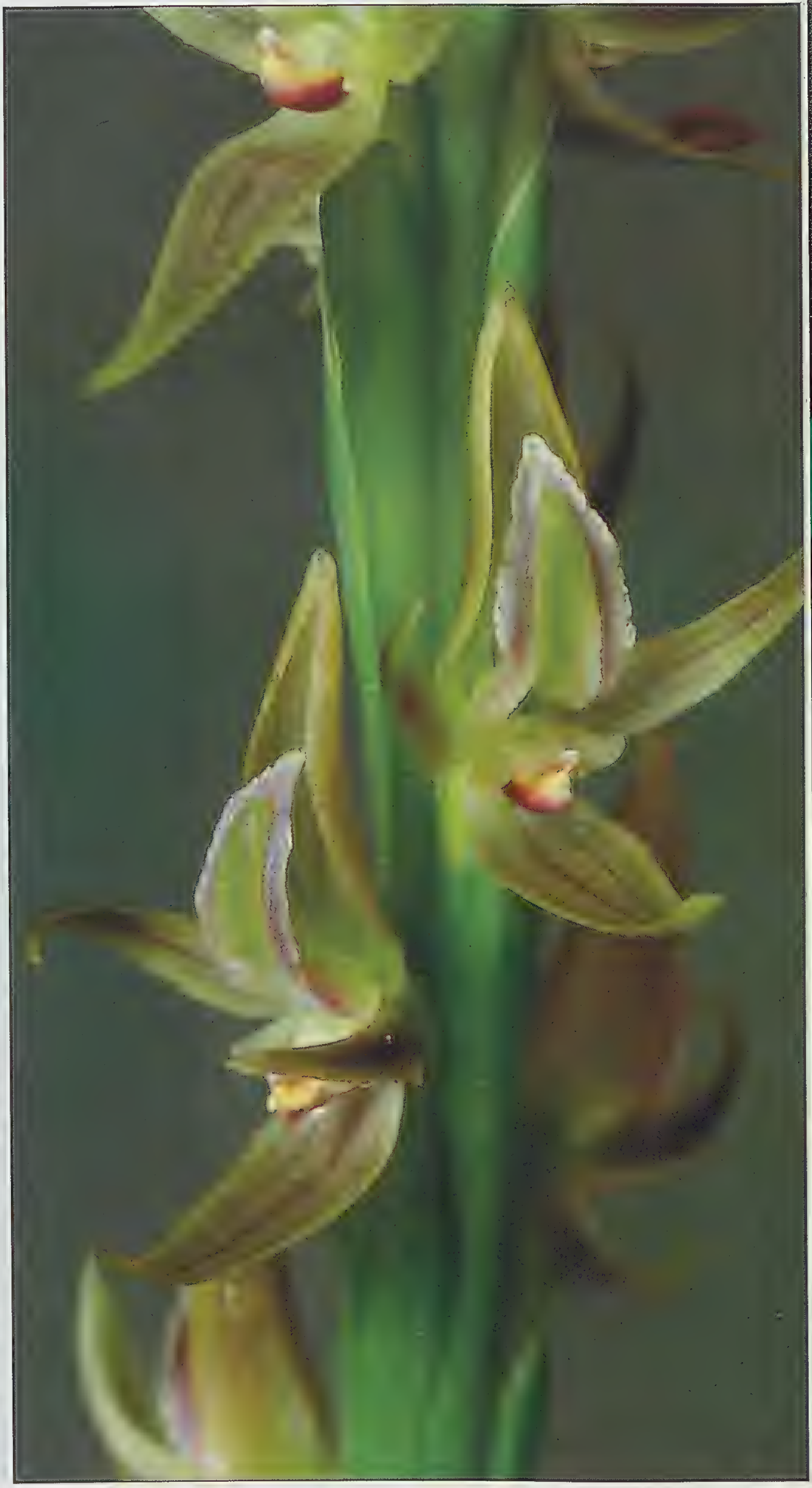
TYPE: Western Australia. Darling District. Darling Scarp, 200 m SE of transmitter tower to E of Canning Mills and Mills Road junction, *G.Brockman 1082*, 12 October 2003 (holo PERTH 6733204).

Illustration: Bottom plate, page 339, Brown *et al.* 2013 – as *Prasophyllum* sp. 'Swan Region'.

Description: *Plants* 50-80 cm tall. *Leaf* 55-70 cm long, dark green to blackish, base 6-8 mm across, reddish, free lamina 10-20 cm long, suberect. *Floral bracts* closely sheathing the base of the ovary, ovate to elliptic, c. 12 mm long, c. 8 mm across, apex acute. *Ovary* closely appressed to the rhachis, linear-oblong, 15-18 mm long, 3-4 mm across. *Inflorescence* a narrow, moderately dense spike 25-35 cm long, consisting of c. 40-70 flowers. *Flowers* sessile, 13-15 mm long, 8-10 mm across, lightly fragrant, internally green to greenish yellow or light greenish brown, externally darker, labellum lamina whitish or mauve, callus green to light mauve. *Dorsal sepal* porrect to incurved, tip often decurved, ovate-lanceolate, 12-14 mm long, c. 4 mm across, margins hyaline, apex subacute. *Lateral sepals* fused throughout, obliquely erect, recurved, each sepal linear-lanceolate, 10-12 mm long, c. 3.5 mm across, apex subobtuse. *Petals* porrect to incurved, linear, 9-11 mm long, c. 3 mm across, margins hyaline, apex obtuse. *Labellum* very shortly stalked, obliquely erect in the basal half, recurved gently in the distal half. *Labellum lamina* cuneate in outline when flattened, 9-10 mm long, 4.5-5.5 mm across, tapered more or less evenly from the base to the apex, distal margins weakly undulate-crenulate, apex subobtuse. *Callus* cuneate, c. 7 mm long, c. 4 mm wide, channelled towards the base, raised and fleshy towards the apex, distal surface raised, slightly irregular, margins entire, extending nearly to the labellum apex. *Column* c. 3 mm long, c. 3.2 mm across, exposed by the wide expansion of the tepals; appendages linear-oblong, falcate, c. 3.5 mm long, 0.8 mm wide, whitish, apex obtuse; basal lobe prominent. *Anther* ovate, c. 2.5 mm long, c. 1.5 mm across, dark purple-brown. *Pollinarium* c. 2.5 mm long, basal part fused; *viscidium* ovate, ca 0.3 mm long, translucent; *hamulus* vestigial; *pollinia* linear-clavoid, c. 1.5 mm long, pale yellow. *Stigma* quadrate, c. 2 mm long, c. 2.2 mm across, the rostellum about as long as the appendages. *Capsules* linear-oblong, remaining appressed to the rhachis, 18-22 mm long, 3-3.5 mm across, green, shiny.

Distribution and ecology: Endemic on the Darling Scarp in Western Australia between Greenmount and Armadale. It grows in freely draining laterite on slopes and ridges in Jarrah-Marri woodland and Casuarina woodland. Flowering occurs late September and October.



Recognition: Robust leek orchid with an elongated spike of crowded, lightly scented green to greenish yellow or light greenish brown flowers with an incurved dorsal sepal, fused lateral sepals held obliquely erect and recurved, porrect to incurved petals and a drawn-out wedge-shaped labellum that is broadest at the base then more or less evenly tapered to the apex, with weakly undulate-crenulate margins and a wedge-shaped callus extending nearly to the labellum apex.

Similar species: *Prasophyllum regium* R.S. Rogers is even more robust than the new species, growing up to 2 m tall with up to 100 flowers that are larger in all their parts with a thickly stalked labellum and a larger, much thicker and fleshier callus. The new species often grows with *P. elatum* which is superficially similar in general appearance but readily distinguished by its callus plate which has strongly raised ridge-like margins.

Notes: Rarely seen as this species needs a hot summer fire to promote flowering.

Conservation status: Of scattered occurrence, observed in Greenmount National Park (where it is common) and John Forrest National Park, following summer fires, Gosnells Regional Open Space and adjacent private property.

Etymology: The Latin *cuneatus* wedge-shaped, in reference to the shape of both the labellum lamina and callus.

Additional specimen: Western Australia. Darling District, Greenmount National Park, 11 Oct. 2016, M.Mallie & *G.B.Brockman 3433* (PERTH).

Acknowledgements

Special thanks to Chris French for companionship on field trips and lively discussions, Mark Clements for access to photos of type specimens, Barbara Jones for reading the manuscript. Also the directors and curators at Canberra and Perth, for allowing access to specimens.

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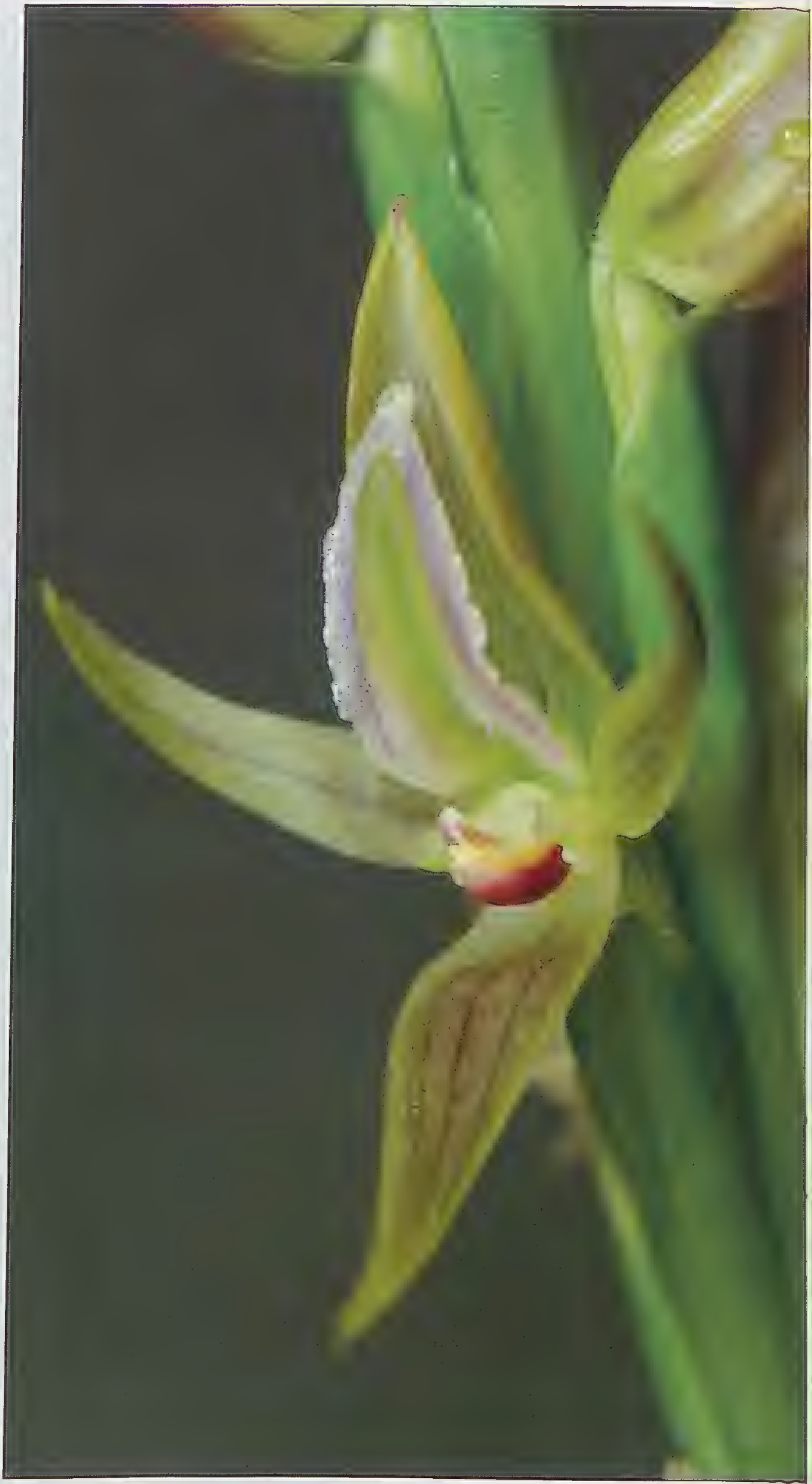
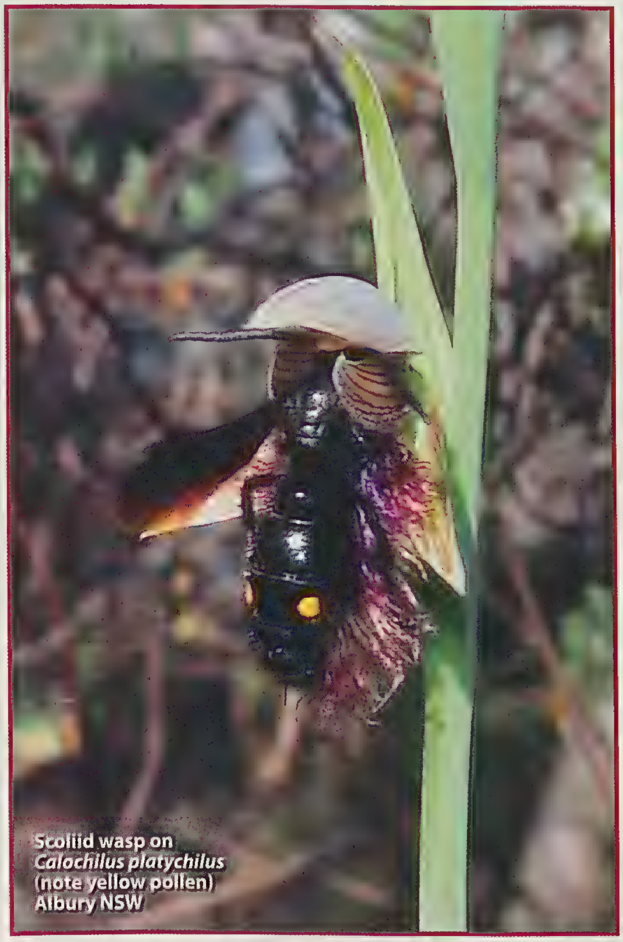


Observations on the Interaction of Scoliid Wasps (*Laeviscolia frontalis*) with Purple Beard Orchids (*Calochilus platychilus*) in Southern New South Wales

Text and photos by Peter Branwhite

When visiting The Rock in late September 2015, there was a nice array of orchids in flower. But it was maybe too early for the Purple Beard Orchids *Calochilus platychilus*, until a single flower was found. Approaching the plant, a large wasp flew in, circling the plant while emitting an audible buzzing sound. It nearly landed on an adjacent half-open flower but resumed circling the plants, soon after landing on the labellum of the open flower. The wasp appeared to be very passive although it did change position on the labellum slightly. There was no vigorous pseudo-copulation. The wasp only stayed on the flower for about 30 seconds before flying off without any pollinia attached.

Shortly after this sighting, I came across a group of 20 plants of *Calochilus platychilus* at Albury's Nail Can Hill Range. I decided to stay and watch for pollinators. With no sign of a Scoliid wasp after 30 minutes, I moved away to look around the vicinity, returning to the population every few minutes to look for wasps. Coming back to the population from a different angle, I saw a new plant which had a Scoliid wasp sitting on the flower. Before it flew off I managed to get a few photos and viewing them later, I could clearly see that the wasp had pollinia stuck to the front of its head. It appeared to be the same species of Scoliid wasp seen at The Rock.

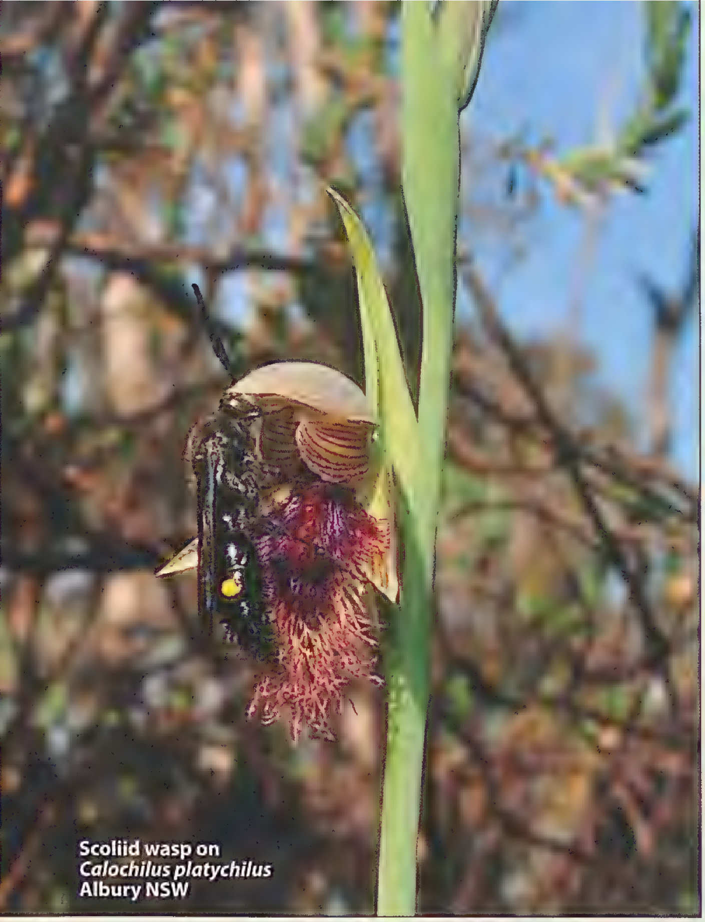

Scoliid wasp on *Calochilus platychilus* (note yellow pollen) Albury NSW

Over the next two hours, I saw a number of wasps approach the *Calochilus* plants and fly in circles around them. Eventually one landed on a flower. Standing about 5 metres away, I moved closer to take photos but must have spooked the wasp. However, I did notice a small amount of pollinia stuck to its head as it flew off.

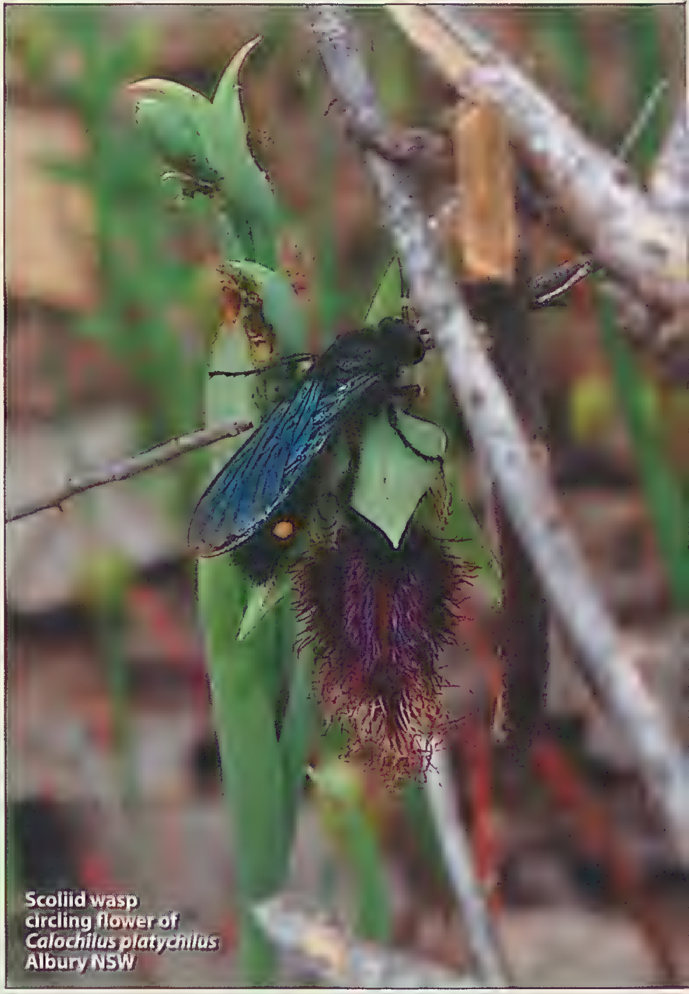
Some time later, another wasp was seen circling the same plant, eventually landing on the labellum. This time there was a very vigorous display of pseudo-copulation lasting several minutes. The wasp flew off but only went a couple of metres before returning to the flower and pseudo-copulating vigorously again. It sat on the flower briefly before flying off again, this time only flying a few centimetres before returning to mate with it for the third time. It was a rather prolonged event lasting almost five minutes. No pollinia were seen on this wasp after any of its attempts to mate with the flower. The small amount of pollinia seen on the wasp that had previously visited the flower suggests that the pollinia had been removed.

Over the space of about 4 hours, I had seen 3 consecutive mating attempts on the one flower, two brief (disturbed) visits to flowers, another with the wasp sitting on the flower with pollinia attached to the front of its head, and about 6 flying visits where the wasp didn't land on any flowers.

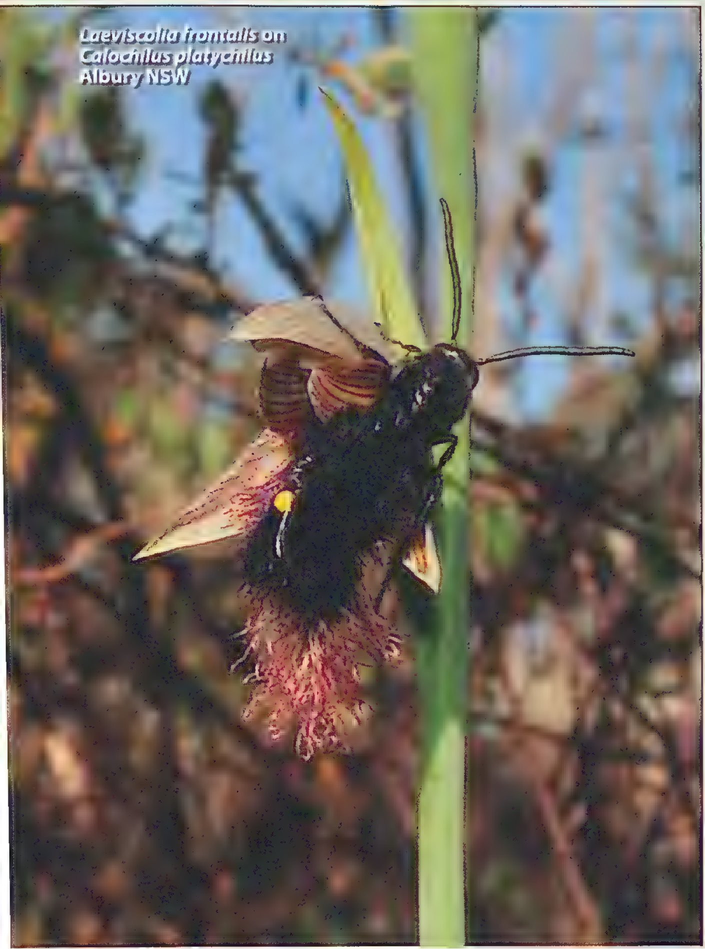
After each visit to a flower, the wasps all flew away from the *Calochilus* plants without visiting a different flower. I did not witness the actual transfer of pollinia from Scoliid wasp to flower, this was affected by the lack of pollinia collected by the individual wasps; and the wasps that did collect pollinia didn't visit other flowers afterwards.



Scoliid wasp on *Calochilus platychilus* Albury NSW



Scoliid wasp circling flower of *Calochilus platychilus* Albury NSW



***Laeviscolia frontalis* on *Calochilus platychilus* Albury NSW**

Many *Calochilus* species are self-pollinated but some also attract male Scoliid wasps which pseudo-copulate with the labellum. The only identified records of Scoliid wasps pollinating *Calochilus* are for *Calochilus campestris* and *Calochilus cupreus*, both have the same pollinator *Campsomeris tasmaniensis*. A photo of an unidentified Scoliid wasp on *Calochilus caeruleus* is published in David Jones' *Complete Guide to Native Orchids of Australia* (2006).

With the wasps seen at both The Rock and Albury obviously not the same Scoliid wasp species' previously recorded as *Calochilus* species pollinators, it was important to get an identification of the wasp involved. After being put in touch with Graham Brown, he was able to identify the species as *Laeviscolia frontalis* (syn. *Scolia frontalis*), also confirming that the various wasp individuals photographed from both sites were males.

Two factors strongly indicate that *Laeviscolia frontalis* is the pollinator of *Calochilus platychilus*: it was the same species of Scoliid wasp at both sites; and the behaviour of the wasp in the vigorous attempts to pseudo-copulate with the flowers at the Albury site. *Laeviscolia frontalis* has been observed visiting *Calochilus platychilus* flowers at two different sites in Albury in 2016.

Acknowledgements:

I would like to thank Graham Brown for his identification of the Scoliid wasps as *Laeviscolia frontalis*. I would also like to thank David Jones and Col Bower for putting me in touch with Graham.

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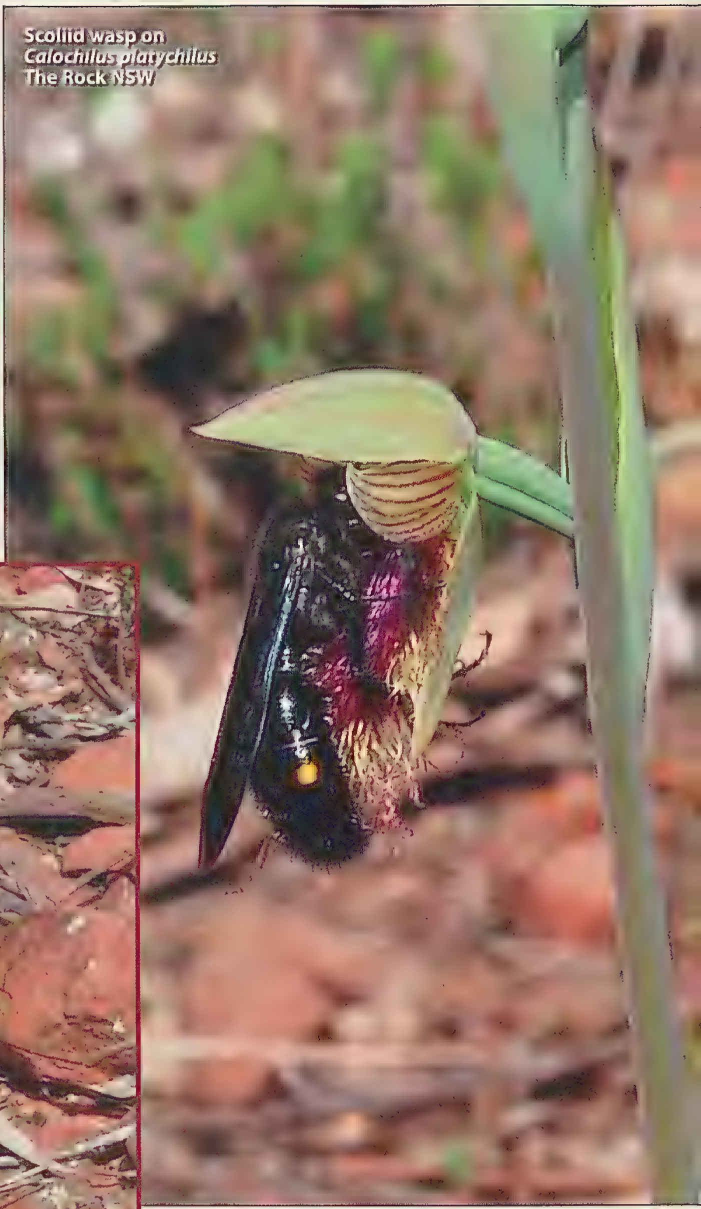
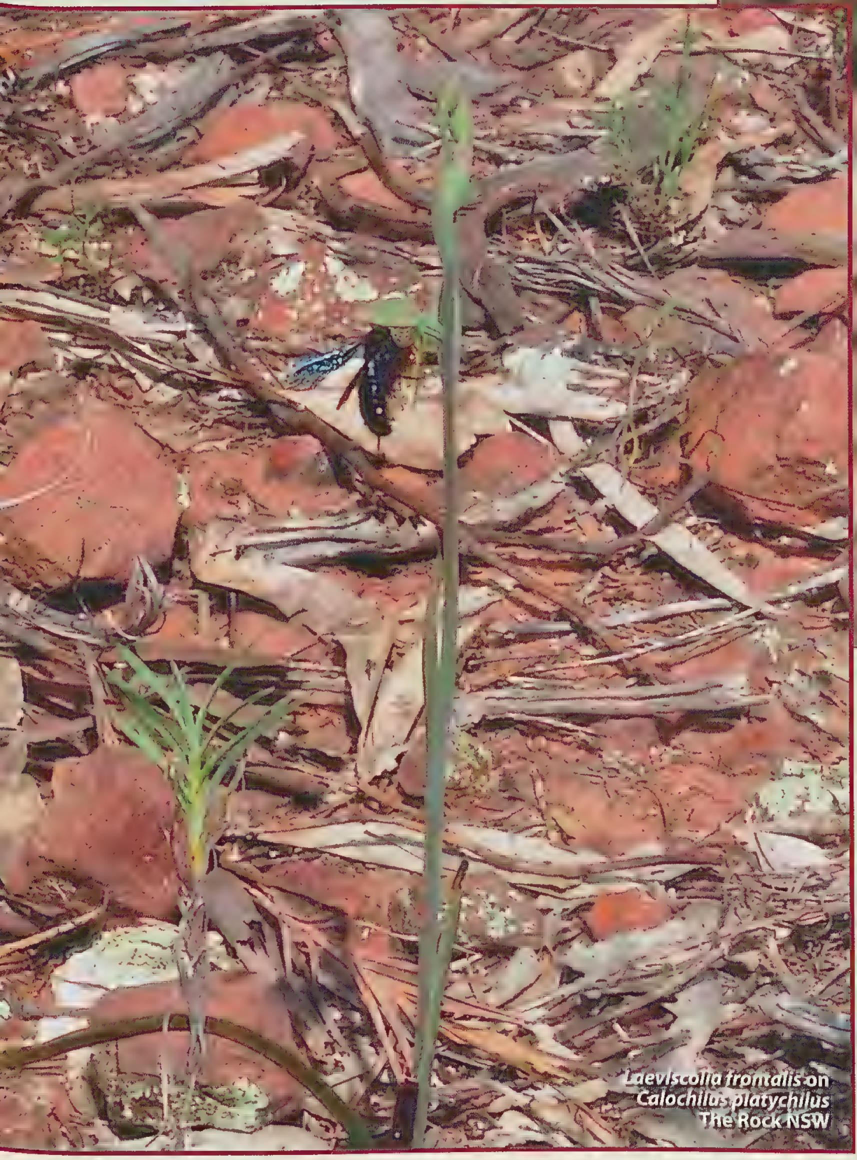


Scoliid wasp on
Calochilus platychilus
The Rock NSW



***Laeviscolia frontalis* on**
Calochilus platychilus
The Rock NSW

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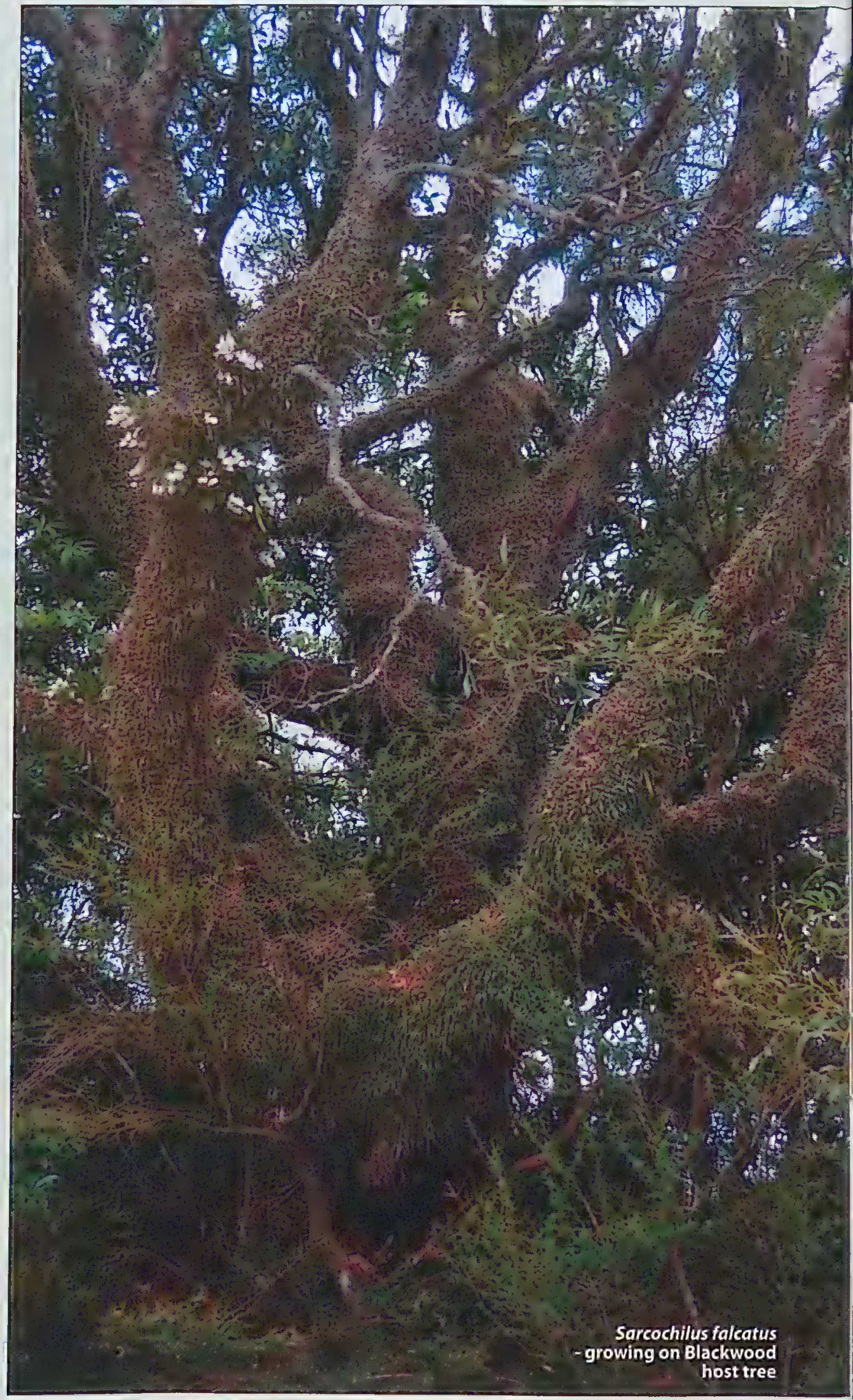
On a Tree by the Road

Text and photos by Alan W. Stephenson

I have been regularly driving past the same tree for 47 years since I first arrived in Nowra in June 1969. But it was not until August 1985 when my orchid interest began and certainly several years later when I first took notice of the tree and even later when I realised what treasures this particular tree contained.

The tree is an Australian Cedar, *Toona australis* and it is just one of many in the Shoalhaven and the Illawarra region of New South Wales. As my orchid interest began to escalate, sometimes seemingly out of control, I became more aware of trees which were obvious hosts for orchid species, despite many of them being on winding and occasionally precarious mountain roads. This particular tree is located in what was a precarious position as far as being able to stop safely to see what species it hosted but the first time I did stop was several years ago and possibly in mid to late October.

This tree I found is host to *Dockrillia linguiformis, Dockrillia pugioniformis* and *Sarcochilus falcatus* and in good seasons all species are available in flower at the same time. In recent years the task of stopping has been made easier by the particular corner being coated with bitumen instead of the previous gravel surface, although getting across the road for a close look and into a position to photograph the orchids still requires reasonable agility and judgement as far as traffic is concerned.



***Sarcochilus falcatus* - growing on Blackwood host tree**

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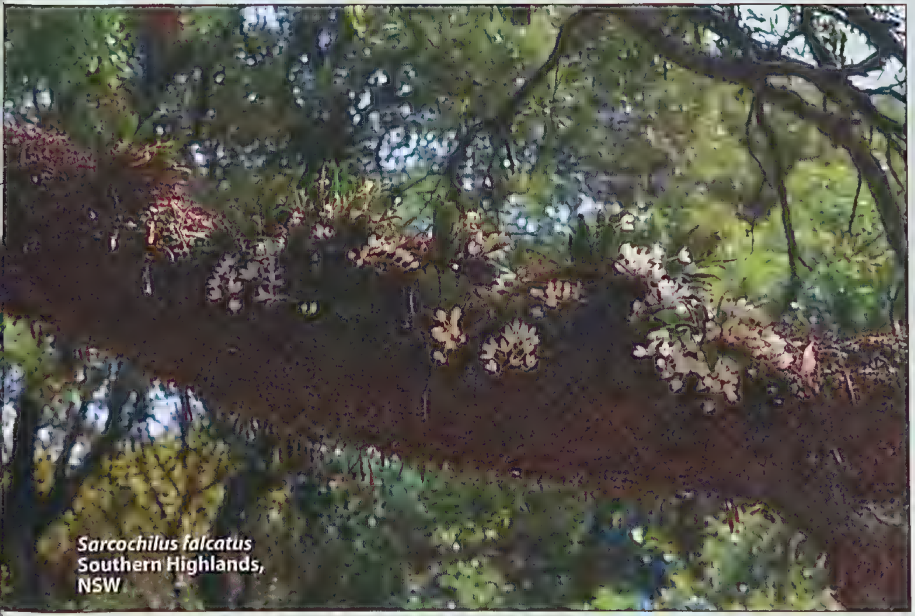
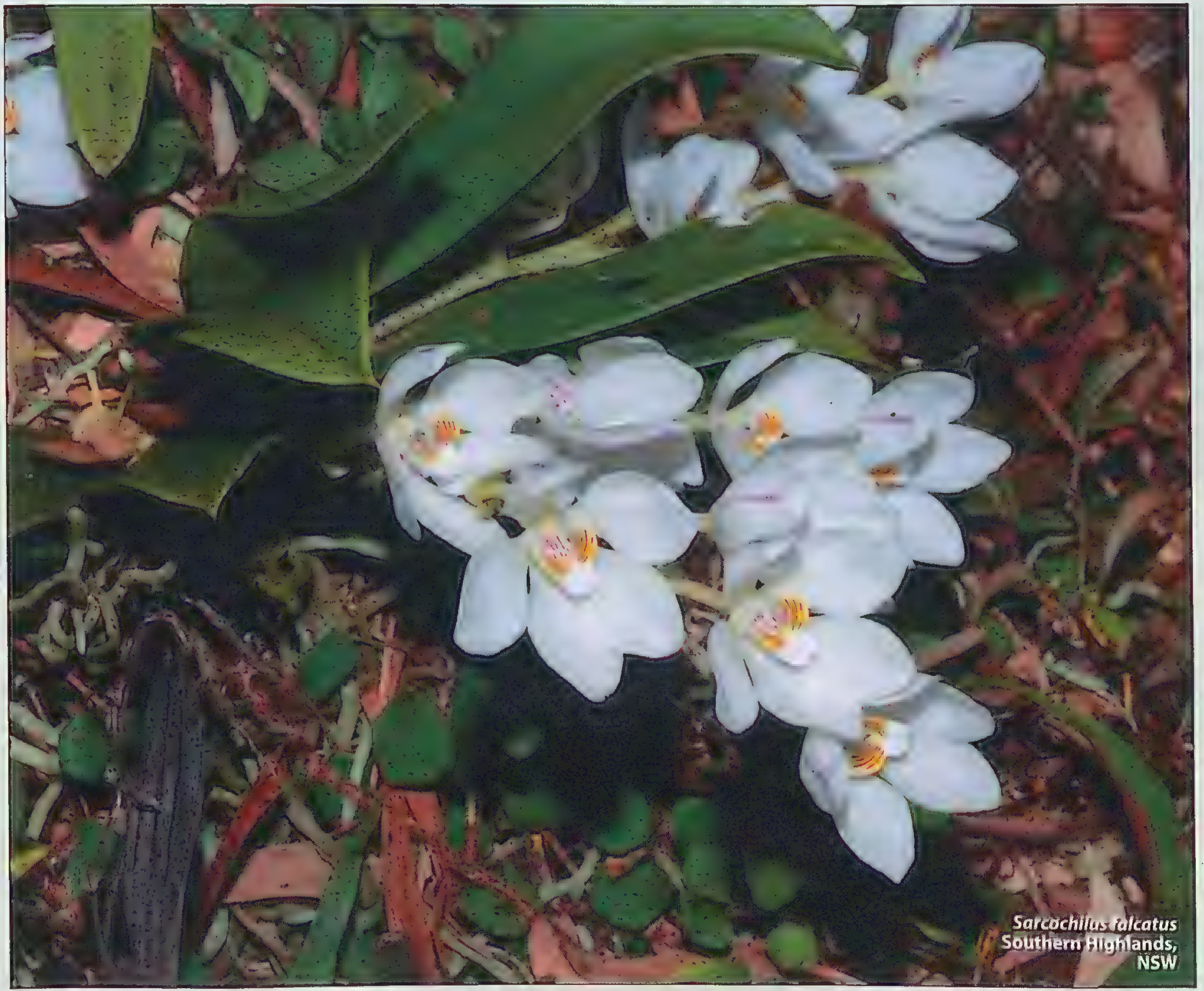


Sarcochilus falcatus
Southern Highlands,
NSW

I have shown this tree and its orchids to numerous local, interstate and overseas orchid persons, varying from friends from South Australia, Victoria, and further afield to Switzerland, France and Germany, and I never cease to be in awe of what it contains and the pleasure others have also gained from this tree by the road. It is certainly not the only tree by the road which contains orchids whether in my area or other areas and certainly other trees in other areas may contain more than three species but its only 15 minutes from my front door and hopefully will be there for many years to come.



Sarcochilus falcatus
Southern Highlands,
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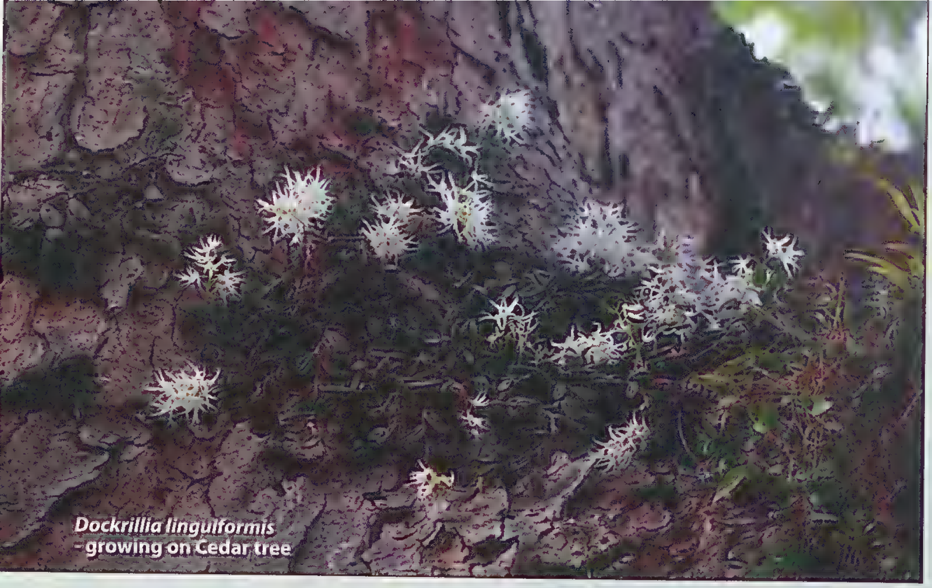
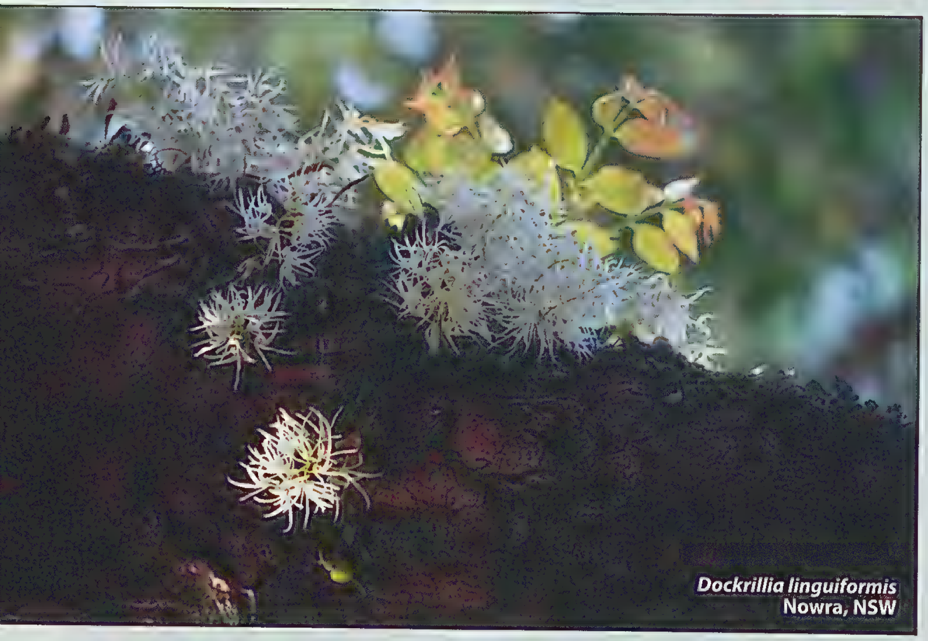
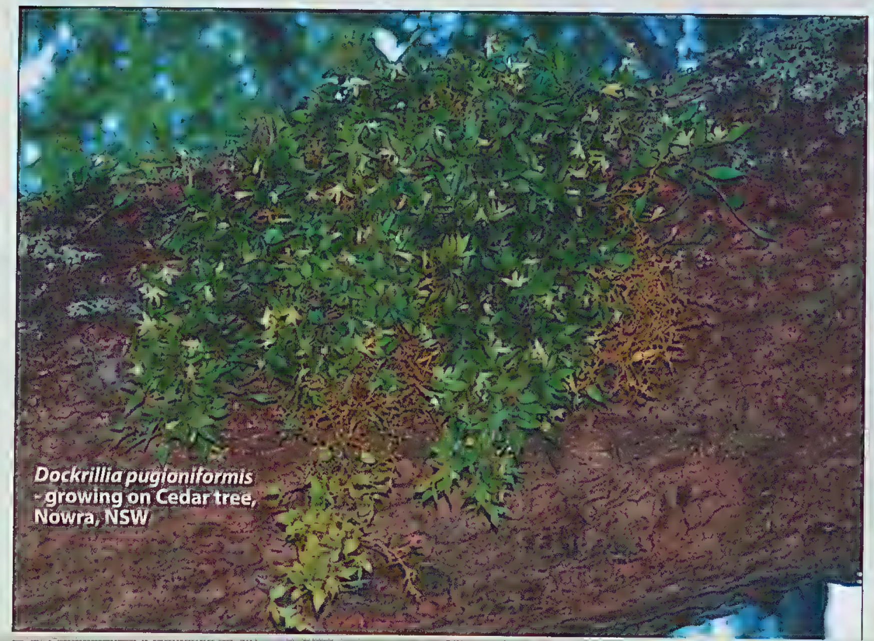

Dockrillia linguiformis - growing on Cedar tree


Dockrillia linguiformis Nowra, NSW


Dockrillia pugioniformis - growing on Cedar tree, Nowra, NSW

I am also a regular visitor to the NSW Southern Highlands and in one particular area there are also several trees by the road and many of these contain orchids, although these are *Acacia melanoxylon* (Blackwood) and the orchid is usually limited to a single species, *Sarcochilus falcatus*, although I have no complaints as it is a firm favourite of mine.

However and with orchids there is always a however and this time it relates not to the orchid but the tree which is host to the orchid. The Blackwoods are heavy with *Pyrrosia rupestris* (Rock felt Fern), which provides a first class habitat for *Sarcochilus falcatus* but a couple of neighbouring trees are also heavily laden with the same fern and also the same orchid. These trees are *Pinus radiata* and despite them being a foreign species and laden with acidic sap, which would normally be considered toxic to native orchids, several plants have been successfully growing and flowering on these trees for some years. The pines are estimated to be 150 years old and were probably planted by early settlers to remind them of places far away. Apart from the *Pyrrosia* the trees have also managed to accumulate a moss in the form of *Wellingtoniana*. This type of moss is also found on trees of all types and sizes in wet forests and rain forests where orchids grow and is an indicator of good orchid habitat.

All this proves is that a rainfall of over 1500 mm per year and an altitude over 700 metres with regular cloud mist can produce an unexpected result. ■

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ORCHID SPECIES OF THE SHOALHAVEN: NSW Australia

by Alan W. Stephenson

Alan Stephenson lives in Nowra and is well placed to give the first botanical treatment of the native orchids of the Shoalhaven region. He has extended the distribution ranges of a number of uncommon and rare species, as well as discovering new taxa. This 68 page book is packed with both information and superb photography, almost exclusively taken by the author. All of the recorded orchid species native to the region are included and illustrated.

The introductory chapters discuss the area covered by this book, the structure of the orchid plants, their natural habitats, parts of an orchid flower, orchid structure and the pollination of orchids. This is followed by the main section of the book that alphabetically lists and discusses each species, with information such as Common Names, Recent Synonyms, Flowering Time in the wild, plus a brief description of the plant, flowers and preferred habitat. There are many terrestrial species fully covered as well as a number of epiphytic and lithophytic genera that are found in the area.

The quality of the printing and colour reproductions are sparking. This is a wonderful field guide that will aid even the most novice naturalist or native orchid enthusiast and confidently assist them in identifying examples they encounter in the field. It represents excellent value, as it also covers many species found naturally along the East Coast of New South Wales.

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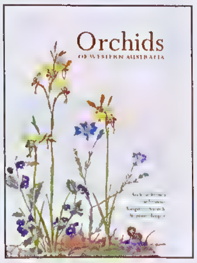
ORCHIDS OF WESTERN AUSTRALIA

by Andrew Brown, Pat Dundas, Kingsley Dixon & Stephen Hopper



Written by three of Western Australia's most prominent orchidologists and featuring over 200 full-page, colour illustrations by renowned botanical artist Pat Dundas, *Orchids of Western Australia* is the first modern text cataloguing all 409 known species.

This comprehensive resource for hardened enthusiasts and initiates alike features a wealth of information in a single volume – from a detailed introduction to WA orchids to information on each species, including who named them, where they were first collected, their habitat, distribution, flowering period, size and distinguishing features. This book is the culmination of decades of work by WA's foremost experts, each dedicated to the conservation of one of the world's most important regional orchid floras.

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How to grow orchids in the backyard

by Robert Friend

It sounds too good to be true, but orchids are as easy to grow in the backyard as a lawn or a bed of roses. Despite their exotic reputation, the everyday gardener can grow orchids without special pots or greenhouses.

The book shows you haw to introduce orchids into the garden, by attaching them to trees, fixing them on rocks and walls, or planting them in garden beds. With more than 150,000 species and hybrids of orchids in the world, there are plants suitable for every garden.

Robert Friend draws on a lifetime's experience with orchids to explain how to choose the right orchid for your climate and how to landscape orchids in different types of gardens. Ranging from tropical to cool climate areas, from large acreages to small courtyard gardens, almost every backyard can enjoy the best of one of nature's wonders.

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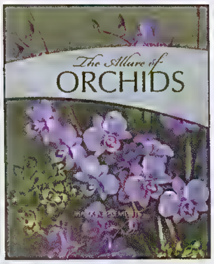
THE ALLURE OF ORCHIDS

by Mark A. Clements



From 1788 when First Fleet artist George Raper painted *Diuris punctata*, the botanical world has been fascinated by Australian orchids. Hundreds of orchid images from the National Library of Australia's collection, with words by Mark Clements from the Australian National Herbarium in Canberra, make *The Allure of Orchids* a must-read for lovers of flowers, original paintings and our indigenous orchids. Many of these unique botanical illustrations are being showcased to a wider audience for the very first time.

The Allure of Orchids features an essay by internationally recognised orchid expert Mark Clements, accompanied by a portfolio of illustrations, both historical and modern, of this alluring species. In it you will find works by around 25 artists, including the extraordinarily detailed lithographs of early botanical illustrator Ferdinand Bower, Ellis Rowan's beautiful paintings, the delicate watercolours of Margaret Cochrane Scott, and many more.

The Allure of Orchids is divided into two parts; Terrestrial or ground orchids and Epiphytic or tree dwelling species. Clements says, "These illustrations can be enjoyed simply as works of art and part of our rich and colourful Australian illustrative heritage. But, significantly, they are also part of the scientific record of this country, particularly during the early exploration of the continent."

Interestingly, a lot of the old and traditional Latin botanical names have been used in this work. The author makes a significant number of anecdotal notes and comments throughout the book, to keep the reader fully informed. It is a "must have" book for those interested in Australian orchids and historical botanical art.

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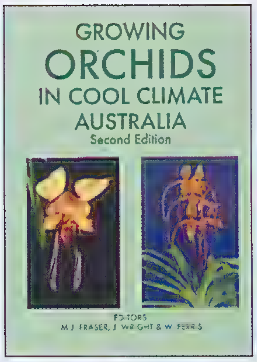

GROWING ORCHIDS IN COOL CLIMATE AUSTRALIA

(Second Edition, 2013)

Editors: Fraser, M.J., Wright, J., & Ferris, W. 2013

This is an update of our earlier book and includes much new material. Written by members of the Orchid Society of Canberra, this book covers topics such as What are Orchids, Structures for growing orchids, potting media, pests and diseases, Orchid nomenclature, Orchid Classification and of course how to grow many types of orchids in cool climate regions of Australia. The main section covers individual cultivation of the most popular types of orchids that we all fall in love with at the beginning... *Cymbidium, Cattleya, Oncidium, Paphiopedilum, Masdevallia, Stanhopea*... and much more. An invaluable reference for novice growers and those with a passion for this delightful plant family.

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HUNTLEYAS AND RELATED ORCHIDS

by Patricia A. Harding

Revered by avid orchid collectors for its delightful, star-shaped flowers, *Huntleya* is a small group of orchids found low in the forest. *Huntleya* is a small orchid genus that includes fourteen species. They occur in wet cloud forests at medium altitudes of Guatemala, Costa Rica, South America down to Bolivia. The type species *Huntleya meleagris* also occurs in Trinidad. Besides their striking colours — from deep blue to waxy red, royal purple to almost black — flowers of this group are known for their distinctive shapes, patterns, and textures. As appealing as these lovely tropical orchids are, their identification has been confused since the first species was described in the mid-1800s. Recent DNA studies have led to a clearer understanding of relationships and, as a result of this clarity, it is now possible to sort out the taxonomic problems and identify the characteristics that set species apart. In this first book devoted to the *Huntleya* alliance, author Patricia Harding presents evidence from the scientific literature, other growers, and her own experience that will enable orchid enthusiasts everywhere to identify their plants and grow them successfully. Patricia A. Harding is an accredited American Orchid Society judge who has been growing and photographing orchids for three decades.

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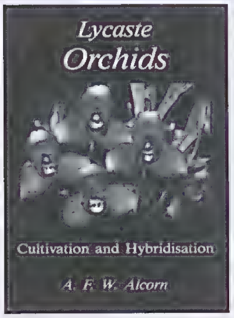

LYCASTE ORCHIDS - Cultivation and Hybridisation

by A.F.W. Alcorn

Lycaste orchids are easy to grow, and they produce flowers that range from the beautiful to the bizarre. No book previously has provided detailed cultural requirements of the Lycaste, and this book should fill that gap, and encourage new growers to take up the cultivation of this beautiful genus. A section on hybridising contains valuable information on inheritance and genetics that will benefit any hybridiser, not just the grower of Lycastes, as well as helpful hints on how to avoid pitfalls in your hybridising program. Michael Hallett, a friend of Fred Alcorn for a number of years, co-wrote this book with Fred and has completed it posthumously. He has a background in genetics, research and botany, and a passion for plants, especially orchids.

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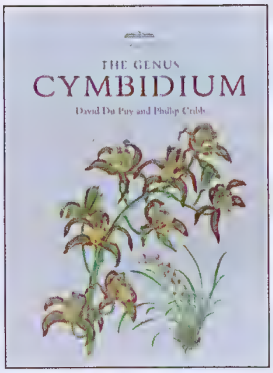

THE GENUS CYMBIDIUM

by David Du Puy and Phillip Cribb

Second edition (2007). Full taxonomic accounts of all 52 species of Cymbidium, including distribution, maps, colour photographs, line drawings and colour paintings. Taxonomic key. Detailed conservation assessment of Cymbidium. Cultivation chapter and breeding chapters as well as chapters covering history, morphology, seed morphology, anatomy, cytology, pollination, uses and phylogeny.

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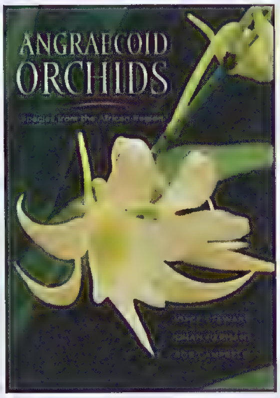

ANGRAECOID ORCHIDS: Species from the African Region

by Joyce Stewart, Johan Hermans, and Bob Campbell

These so-called 'Jewels of Africa' with their sparkling flowers, distinctive growth habit and floriferous nature are much prized and this account, the first to include the Angraecoid orchids of both Africa and Madagascar, is long awaited. It brings together, in a single volume, descriptions of all 690 species in this intriguing group of orchids and will be the essential reference for all Angraecoid orchid enthusiasts for years to come. Including such horticulturally important genera as *Angraecum, Aeranthes, Aerangis* and *Jumellea*. Stewart, Herman and Campbell have all spent time in various parts of eastern and southern Africa and precise ecological information relating to habitat, altitude preferences and flowering season of individual plants will be particularly helpful to growers. The diagnostic features of each genus are illustrated and over half the species are accompanied by exquisite photographs taken in both wild habitats and in cultivation.

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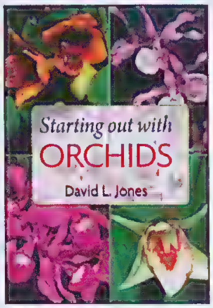

STARTING OUT WITH ORCHIDS

by David L. Jones

David Jones is arguably one of Australia's most prolific, precise and respected botanical and horticultural authors. The book is divided in two parts. Part One begins with the cultivation chapters, covering Easy Orchids for Beginners, General Cultivation Requirements, Growing Epiphytic Orchids, Growing Terrestrial Orchids, Orchid Pests and Diseases, Housing Your Orchids and Propagating Your Orchids. The information contained within these pages alone is required reading for all beginners through to experienced orchid growers. The text is very easy to read and understand with numerous sound cultivation tips and treatments discussed. There are many excellent and clear line illustrations that help describe terms or highlight diagnostic features. There are over 250 colour photographs.

Part Two discusses the orchids themselves with concise information on each species. They are grouped primarily according to climatic requirements, starting with cool growing orchids progressing to the warm growers, in alphabetical sequence first with terrestrial genera, followed by the epiphytes. Both Australian and exotic species are treated together. For each entry there is specific detailed information on each species, as well as a simple table giving the basic cultivation needs and flowering season. A glossary is also included to explain unfamiliar terms.

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New combinations in the South Australian *Caladeniinae*

by Robert J. Bates

The following combinations in the *Caladeniinae* are necessary to allow for the different taxonomic views held at generic level within the subtribe!

Caladenia bruniella (R.J. Bates) R.J. Bates, **comb. nov.** Basionym *Arachnorchis bruniella* R.J. Bates *Austral. Orch. Rev.* 81 (4) 41 (2016).

Caladenia campestris (R.J. Bates) R. J. Bates, **comb. nov.** Basionym *Arachnorchis campestris* R.J. Bates *Austral. Orch. Rev.* 81 (5) 53 (2016).

Caladenia transitoria subsp. *isolata* (R.J. Bates) R.J. Bates, **comb. nov.** Basionym *Stegostyla transitoria* (D.L. Jones) subsp. *isolata* R. J. Bates *Austral. Orch. Rev.* 81 (4) 44 (2016)

Petalochilus littoricola (R.J. Bates) R.J. Bates, **comb. nov.** Basionym *Caladenia littoricola* R.J. Bates *Austral. Orchid Rev.* 80 (1) 25 (2015).

Petalochilus pygmaeus (R.S. Rogers), R.J. Bates **comb. nov.** Basionym *Caladenia carnea* var *pygmaea* R.S. Rogers *Proc. Roy. Soc. S. Austral.* 15 (13) 1927. See also R.J. Bates *Austral Orch. Rev.* 79 (5) 56 (2014) as *Caladenia pygmaea* (R.S. Rogers) R.J. Bates. ■

Robert J. Bates
Fairview Park, South Australia
Email: bobbates63@hotmail.com

New combinations in three recently described terrestrial orchids (Orchidaceae) from New South Wales

by Lachlan M. Copeland and David L. Jones

The following new combinations in the Orchidaceae are necessary to cater for the different genera accepted by different taxonomists and herbaria throughout Australia. In the Pterostylidinae, for example, some workers prefer some of the smaller segregate genera while in contrast to these views the National Herbarium of New South Wales only recognises *Pterostylis* in the broad sense. Regardless of which taxonomy is preferred, it is often desirable to have alternate validly published names available. This can facilitate easier listing/recognition of threatened species on the relevant threatened species legislation as well as assist in the curation of plant specimens in different herbaria and online websites.

Corybas globulus (D.L.Jones & L.M.Copel.) L.M.Copel. & D.L.Jones, **comb.nov.** Basionym: *Anzybas globulus* D.L.Jones & L.M.Copel. *Austral. Orch. Rev.* 81(3): 40, (2016).

Pterostylis rubiginosa (D.L.Jones & L.M.Copel.) L.M.Copel. & D.L.Jones, **comb.nov.** Basionym: *Speculantha rubiginosa* D.L.Jones & L.M.Copel., *Austral. Orch. Rev.* 81(3): 45, (2016).

Pterostylis divaricata (D.L.Jones & L.M.Copel.) L.M.Copel. & D.L.Jones, **comb.nov.** Basionym: *Diplodium divaricatum* D.L.Jones & L.M.Copel., *Austral. Orch. Rev.* 81(3): 42, (2016). ■

Lachlan M. Copeland
Email: lachlanc@ecoaus.com.au

Dendrobium chlorostylum

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